EXHIBIT F

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ENTROPIC COMMUNICATIONS, LLC,
 	
     Plaintiff,
 	
v.
 	
CHARTER COMMUNICATIONS, INC.,
 	
     Defendant.
	
	Civil Action No. 2:22-cv-00125-JRG

DEFENDANT'S FIRST SUPPLEMENTAL INVALIDITY AND SUBJECT-MATTER ELIGIBILITY CONTENTIONS

Pursuant to the Court's Amended Docket Control Order (Dkt. 89), the Court's Standing Order Regarding Subject-Matter Eligibility Contentions (the "Standing Order"), and the Court's Patent Rules 3-3 and 3-4, Defendant Charter Communications, Inc. ("Defendant") respectfully submits these Supplemental Invalidity and Subject-Matter Eligibility contentions with respect to the asserted claims of U.S. Patent Nos. 8,223,775 (the "'775 Patent"), 8,284,690 (the "'690 Patent"), 8,792,008 (the "'008 Patent"), 9,210,362 (the "'362 Patent"), 9,825,826 (the "'826 Patent"), and 10,135,682 (the "'682 Patent") (collectively, the "Asserted Patents") identified by Plaintiff Entropic Communications, LLC, ("Entropic" or "Plaintiff") in its Second Amended Complaint and in its disclosures under Patent Rules 3-1 and 3-2 (its "Infringement Contentions" and "Supplemental Infringement Contentions").

The currently asserted claims, as reflected in Plaintiff's Supplemental Infringement Contentions, are:

- Claims 18-19 of the '775 Patent;

- Claims 1, 7-9, 11, and 15-16 of the '690 Patent;

1

- Claims 1 and 2 of the '008 Patent;

- Claims 11 and 12 of the '362 Patent;

- Claims 1-4 and 6-9 of the '826 Patent; and

- Claims 1-3 of the '682 Patent;

As detailed further below, the Asserted Patents are anticipated by, or obvious in view of, one more of the prior art references previously produced at CHARTER_ENTROPIC00033653 - CHARTER_ENTROPIC00046345 and at CHARTER_ENTROPIC00380637 - CHARTER_ENTROPIC00381855 pursuant to 35 U.S.C. § 102 and/or § 103, as well as invalid under 35 U.S.C. §§ 101 and 112.

Defendant supplements its Invalidity Contentions based on its current understanding of Plaintiff's infringement position and other facts revealed to date during discovery. Defendant incorporates herein the positions set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104). Defendant, furthermore, reserves the right to amend or further supplement these contentions in view of any further supplementation of Plaintiff's Infringement Contentions, in view of any facts revealed in discovery, and pursuant to P.R. 3-6.

I.   PRELIMINARY STATEMENT

These supplemental invalidity contentions and subject-matter eligibility contentions are based on Defendant's current knowledge and understanding of the Asserted Patents and prior art, of Plaintiff's infringement theories (inasmuch as they can be inferred from its Supplemental Infringement Contentions), and of the facts and other information available as of the date of these supplemental invalidity contentions. Defendant's investigation, discovery, and analysis of information related to this action is ongoing. Additional discovery, elucidation of Plaintiff's impermissibly vague infringement contentions, and/or orders of the Court may require Defendant

to amend or further supplement these invalidity contentions and subject-matter eligibility contentions, and Defendant expressly reserves the right to do so as the case proceeds. These supplemental contentions represent Defendant's good-faith effort to provide a comprehensive identification of prior art relevant to this case. Defendant, however, reserves the right to modify or further supplement its prior art list and invalidity and subject-matter eligibility contentions at a later time with, or based upon, pertinent information that may be subsequently discovered.

A.   **No Waiver**

Nothing in these supplemental invalidity and subject-matter eligibility contentions is intended, nor should be construed, as a waiver of any noninfringement position or argument under 35 U.S.C. §§ 101 or 112. Defendant's statements herein (including the accompanying claim charts) reflect Defendant's present understanding of the purported scope of the claims as alleged by Plaintiff in its Supplemental Infringement Contentions (as best those contentions can be understood in light of their present deficiencies).

The asserted claims have yet to be construed. As a result, Defendant has based these supplemental invalidity and subject-matter eligibility contentions upon its knowledge and understanding of the potential scope of the asserted claims at this time, and, in part, upon the apparent interpretations of the asserted claims advanced by Plaintiff in its Supplemental Infringement Contentions. Defendant may disagree with Plaintiff's interpretation of the meaning of many terms and phrases in the asserted claims. Defendant has provided these supplemental invalidity and subject-matter eligibility contentions based in part on its present understanding of Plaintiff's apparent constructions and interpretations of the asserted claims. These supplemental invalidity and subject-matter eligibility contentions do not represent Defendant's agreement or view as to the proper interpretation of any claim term contained therein. Any similarity between any apparent claim interpretation in any of Defendant's invalidity charts submitted herewith and

3

in any of the contentions supplied by Plaintiff is not an admission or agreement with Plaintiff about the meaning of any claim term, but rather a reflection of the fact that the subject matter Plaintiff believes is claimed is present in the prior art, or that the claims are otherwise invalid. These supplemental invalidity and subject-matter eligibility contentions are made in the alternative, and should not be interpreted to rely upon, or in any way affect, the non-infringement arguments Defendant may advance in this case. Defendant reserves the right to further amend, supplement, or materially modify its invalidity and subject-matter eligibility contentions as the case proceeds. Defendant also reserves the right to further amend, supplement, or materially modify its invalidity and subject-matter eligibility contentions based on any infringement and/or additional claim construction positions that Plaintiff may take in this case.

Defendant also reserves the right to further amend, supplement, or materially modify its invalidity and subject-matter eligibility contentions in response to any claim construction or interpretation positions that Plaintiff may take. Defendant also reserves the right to assert that a claim is indefinite, not enabled, or fails to meet the written description requirement of 35 U.S.C. § 112 based on any claim construction or interpretation position Plaintiff may take in this case or based on any claim construction the Court may adopt in this case.

B.   No Admission

Nothing disclosed herein is an admission or acknowledgement that any product accused of infringement by Plaintiff in its Supplemental Infringement Contentions (the "Accused Products"), or any of Defendant's other products or services, infringes any of the asserted claims.

Defendant further notes that Plaintiff appears to rely upon overly broad interpretations of the asserted claims. At the same time, Plaintiff's Supplemental Infringement Contentions are in most places too general and vague to discern Plaintiff's infringement theories and how exactly Plaintiff contends each Accused Product meets or practices each element of the asserted claims.

Specifically, Plaintiff's Supplemental Infringement Contentions fail to clearly identify the aspects or features of the Accused Products that Plaintiff contends meet the elements of the asserted claims. As a result, Defendant has been prejudiced in its ability to prepare these supplemental invalidity and subject-matter eligibility contentions. In addition, Plaintiff's Supplemental Infringement Contentions, in many cases, continue to fail to put Defendant on notice of Plaintiff's interpretation of the asserted claims, further prejudicing Defendant's ability to identify relevant prior art. In addition, Plaintiff has not identified theories of infringement under the doctrine of equivalents for any of the Asserted Patents. Defendant has relied on Plaintiff's apparent representation that it has no doctrine of equivalents theories for any claims in preparing these supplemental invalidity and subject-matter eligibility contentions, and any attempt by Plaintiff to present an untimely doctrine of equivalents assertion would be severely prejudicial to Defendant. To the extent that Plaintiff is later permitted by the Court to amend its contentions to cure any deficiencies of its current contentions or to pursue any currently undisclosed doctrine of equivalents theories, Defendant expressly reserves the right to further supplement or amend these invalidity and subject-matter eligibility contentions to account for such amendments.

To the extent that any prior art references disclose the same functionality or feature of any of the Accused Products, Defendant reserves the right to argue that said feature or functionality does not practice any element of any of the asserted claims, and to argue, in the alternative, that if said feature or functionality is found to practice any element of any of the asserted claims, then the prior art reference demonstrates that the element is not novel, is obvious, and/or is otherwise not patentable.

Attached hereto are representative claim charts that identify where the elements of the asserted claims of the Asserted Patents may be found in the prior art and further identifying why

5

those references are not novel or non-obvious. The references cited in the attached claim charts may disclose the limitations of the asserted claims expressly and/or inherently. The suggested obviousness combinations may be presented in conjunction with or in the alternative to Defendant's contentions regarding anticipation. These obviousness combinations should not be construed to suggest that any reference included in any combination is not anticipatory in its own right. Further, to the extent that Plaintiff contends that any of the references identified do not constitute prior art under 35 U.S.C. § 102, Defendant reserves the right to rely upon other prior art references in the same patent family with substantially identical disclosures as evidence of invalidity based on the same theories as those disclosed below.

C.   Reservation of Rights

Prior art not currently included in this disclosure may become relevant. Defendant is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the asserted claims are not disclosed in the prior art identified by Defendant. Defendant reserves the right to identify other references that would have made the addition of the allegedly missing limitation to the disclosed device or method obvious or show that the allegedly missing limitation would have been known or readily apparent to one of ordinary skill in the art at the time of the invention in light of the disclosure of the prior art at issue. Defendant further reserves the right to rely on any of the references produced at CHARTER_ENTROPIC00033653 - CHARTER_ENTROPIC00046345 in order to demonstrate the state of art at the alleged times of invention and as evidence of the knowledge of one of ordinary skill in the art[1] in support of any

---

[1] For purposes of these Invalidity and Subject-Matter Eligibility Contentions, the term "general knowledge" includes the common knowledge and common sense of a person of ordinary skill in the art ("POSITA") as well as the general knowledge of POSITAs in a particular field.

motivations to modify or combine the charted prior art references with other references or knowledge.

Plaintiff may also be aware of additional prior art that is not known to Defendant. To the extent that Plaintiff produces additional prior art responsive to Defendant's discovery requests after these contentions are served, Defendant may further supplement its invalidity contentions with prior art contained in such production once Defendant has had a fair opportunity to review, analyze, and chart such prior art. Defendant reserves the right to amend its invalidity contentions with any additional potential prior art known by Plaintiff but not yet disclosed to Defendant.

Defendant provides these supplemental invalidity and subject-matter eligibility contentions only for the claims that have been asserted by Plaintiff, but reserve the right to seek invalidation of all claims in each of the Asserted Patents.

D.   Ongoing Investigation

Defendant's investigation is ongoing, and Defendant expressly reserves the right to amend its disclosures and document production to account for evidence uncovered as its investigation continues. Such amendments include identifying and relying on additional references that may result from Defendant's further search and analysis. Defendant reserves the right to further supplement these contentions in light of any additional prior art of which Plaintiff is aware and fails to disclose to Defendant in discovery, or that might be subsequently disclosed by Plaintiff in response to Defendant's discovery requests. Defendant has and anticipates issuing further subpoenas to third parties believed to have knowledge, documentation and/or corroborating evidence concerning some of the prior art listed herein and/or additional prior art. These third parties include, but are not limited to, the authors, employers of authors, inventors, assignees, or former or current employees of assignees or previous assignees, of the references identified in these supplemental invalidity contentions. For example, Defendant has and anticipates issuing

further subpoenas to potential prior artists including but not limited to individuals and entities responsible for the development of prior art systems. Defendant reserves the right to further supplement these contentions in light of any newly discovered information produced by these or other entities from which Defendant may seek discovery.

II.   ALLEGED PRIORITY DATE OF THE ASSERTED PATENT CLAIMS

Plaintiff asserted the following priority dates for the asserted claims in its Supplemental Infringement Contentions:

Asserted Patent	Filing Date	Priority Claim(s)
'775 patent	Sept. 30, 2003	Sept. 30, 2003
'690 patent	Dec. 10, 2009	U.S. Provisional Patent Application No. 61/122,687 (filed Dec.15, 2008) U.S. Provisional Patent Application No. 61/179,454 (filed May 19, 2009)
'008 patent	Sept. 10, 2012	U.S. Provisional Patent Application No. 61/532,098 (filed Sept. 8, 2011)
'362 patent	Dec. 8, 2015	U.S. Provisional Patent Application No. 61/170,526 (filed Apr. 17, 2009)
'826 patent	Nov. 23, 2015	U.S. Provisional Patent Application No. 61/532,098 (filed Sept. 8, 2011)
'682 patent	Jan. 9, 2018	U.S. Provisional Patent Application No. 61/674,742 (filed Jul. 23, 2012)

It is Plaintiff's burden to show entitlement to its asserted priority dates, and Defendant asserts that Plaintiff has failed to meet that burden. Plaintiff has further failed in its obligations to disclose "the priority date to which each asserted claim allegedly is entitled" (P.R. 3-1(e)) by (1) failing to set forth, for each of the '690, '008, '362, '826, and '682 Patents, the priority date that each

Asserted Claim is entitled to, and (2) disclosing, for the '008 and '826 Patents, an ambiguous, unsupported, and improper priority date of "at least as early as February 15, 2011." To the extent Plaintiff attempts to rely on a priority date that precedes the filing date of any prior application, Defendant reserves the right to further supplement these contentions.

A.   '008 and '826 Patents

Further, the '008 and '826 Patents' claims of priority to U.S. Provisional Patent Application No. 61/532,098 (the "'098 Provisional") are improper. Specifically, the written description of the '098 Provisional does not support the subject matter claimed in either the '008 and '826 Patents.

For example, Claim 1 of the '008 Patent requires a "signal monitor operable to . . . report said determined characteristic to a source of said received signal." '008 Patent, 7:20-24. Similarly, Claim 1 of the '826 Patent requires "controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal, wherein said measured characteristic is different than said network management messages." '826 Patent, 7:51-55.

The written description of the '098 Provisional, however, does not set forth any disclosure sufficient to demonstrate that the inventor had possession of at least the above clamed subject matter at the time of filing the '098 Provisional or earlier, nor does the '098 Provisional describe at least the above claimed subject matter in such full, clear, concise, and exact terms to enable an ordinarily skilled artisan to practice the alleged inventions of either the '008 or '826 Patents. Accordingly, for at least this reason, the '008 Patent and '826 Patent are not entitled to claim priority to the '098 Provisional.

III.   THE '775 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits A1 through A5[2] and/or described below anticipate and/or render obvious, alone or in combination, the asserted claims of the '775 Patent.

1.   The '775 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '775 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits A1 through A5, which identify specific examples of where each limitation of the asserted claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references as anticipating one or more of the asserted claims of '775 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '775 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

---

[2] Exhibits A1-A4 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

a)   **Prior Art Patents and Publications**

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent App. Pub. No. 2001/0039600 A1	November 08, 2001	Brooks	A1
U.S. Patent No. 6,493,874	December 10, 2002	Humpleman	A2
U.S. Patent App. Pub. No. 2003/0161333 A1	August 28, 2003	Schain	A3
U.S. Patent No. 7,127,734	October 24, 2006	Amit	A4
U.S. Patent App. Pub. No. 2004-0160945 A1	August 19, 2004	Dong	A5

b)   **Prior Art Systems**

Defendant's further investigation and/or subsequent discovery from Plaintiff or third

parties with knowledge regarding prior art systems may reveal additional information about

relevant prior art systems. Defendant reserves the right to further supplement these Invalidity

Contentions based on subsequent investigation and discovery, including from third parties. In

particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the

control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public

knowledge or use that embodies or otherwise incorporates any of the prior art patents and

publications listed above. Defendant further reserves the right to identify and rely on systems

that represent different versions or are otherwise related variations of the identified systems.

Defendant also incorporates by reference any and all other prior art systems identified in any

other case brought by Plaintiff and/or involving the Asserted Patents.

* * * * *

11

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '775 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '775 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '775 Patent is not explicitly disclosed by any prior art identified above and/or in Exhibits A1 through A5, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits A1 through A5 with each other, at least because all of these references relate to cable television, broadband networking, and home networking in the same field of endeavor.

For example, U.S. Patent Application Publication No. 2001/0039600 A1 ("Brooks") teaches a "cable modem having a programmable media access controller (MAC). A single cable modem device includes all necessary MAC functions. The invention allows programmable MAC functions to support evolving standards (e.g., DOCSIS) without requiring expensive hardware upgrades. Bifurcated microprocessor architecture, in which first processing circuitry is programmed to implement MAC functionality for processing information flowing to and from cable media interface circuitry, and second embedded processor core or host system processor provides operating system functionality are used. Alternatively, separate processor cores provide MAC functionality for downstream and upstream data paths, respectively. Cable media interface

circuitry, and other peripheral circuitry, are coupled to a peripheral bus that is linked by a bridge circuit to a system bus. The processing circuitry MAC is communicatively coupled to the system bus. Centralized DMA control directs data transfer between the peripheral and system buses as determined, at least in part, by the programmable MAC." Brooks at Abstract.

Furthermore, U.S. Patent No. 6,493,874 ("Humpleman") teaches a "set-top electronics and network interface unit arrangement [that] is connected to an internal digital network interconnecting devices in the home. The digital network operates on a single, nomodulated, baseband channel. Entertainment services are introduced into the network through network interface units that are coupled to an external network and to the internal network. The network interface units perform the necessary interfacing between the external and internal networks, and make the entertainment services available to all terminals connected to the internal network. Set-top electronics that are separate from the network interface units connect to the internal network and convert the information in the digital data stream for display, by a television, for example." Humpleman at Abstract.

Similarly, U.S. Patent Application Publication No. 2003/0161333 A1 ("Schain") teaches a "broadband gateway [] that combines a broadband modem [] and a residential gateway [] in a single unit. The single unit features a unique dual bridge, shared module architecture that reduces redundancy in the broadband gateway [] at the same time it minimizes interactions between modules in the broadband gateway []. This minimized interaction permits the broadband gateway [] to operate at peak efficiency and allows for continued development of portions of the broadband gateway [] without necessarily incurring compliance testing for the broadband portion of the broadband gateway []." Schain at Abstract.

13

U.S. Patent No. 7,127,734 ("Amit"), moreover, discloses "a system and methods for communication between subscribers' devices over cable infrastructure designed to carry video signals, using pass-band frequency bands, without transmission through a CATV headend device. A particular application of this system and method is home networking over coaxial TV cables. The disclosed system will allow very high-speed digital and analog communications within the home and from the home to external devices or networks using low cost devices. The present invention provides home networking solutions that utilize in-home TV wiring for supplying high rate connectivity between any two home networking nodes. The present invention does not load the city cable TV (CATV) network." Amit, 2:34-48.

Furthermore, U.S. Patent Application Publication No. 2004-0160945 A1 ("Dong") discloses a "network communication system with a stand alone multi-media terminal adapter." The invention provides "a stand alone multi-media terminal adapter for coupling to a network access module over a communication link" with a network access module that "may be a cable modem and the communication link may be an Ethernet link or a USB link." Dong, ¶ 13. The network access module "communicates over a frame switched network with a network controller" and "requests reservation, commitment, and deletion of time division logical channels between the access module and the network controller over the frame Switched network." *Id.* Moreover, "[t]he framed switched network may be a hybrid fiber/cable (HFC) network and the network controller may be a cable modem termination server (CMTS)." *Id.i*

Accordingly, because the identified references are directed to similar devices in similar fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the teachings of two or more references with a reasonable expectation of success.

a) **"a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment" (Claim 18)**

To the extent that it is determined that any of the above references do not disclose "a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Schain discloses "The cable modem device 100 can be implemented in a variety of products, including external or internal cable modems with Ethernet and/or USB connections, multifunction home-networking products, interactive set-top-box solutions, digital satellite receivers, wireless networking devices having antennas, Small Office/Home Office (SOHO) equipment and Internet Protocol (IP) telephony products. Accordingly, various embodiments of the invention may interface with non-traditional 'cable media (e.g., any type of media capable of transporting MPEG packets), and the precise nature of the data transmission media is not considered critical to the invention."). Schain at ¶ [0025]. *See also id.* at ¶ [0027] ("The broadband modem 120 converts the data being transmitted on broadband medium into a data format, usually Internet protocol (IP) over Ethernet, which is usable by the computer equipment and vice versa. The residential gateway 130 takes the data provided by the broadband modem 120 and provides it to the subscriber's equipment and vice versa."); *id.* at ¶ [0033] ("If the external packet is destined for the cable modem (i.e., it's destination is one of the IP based processes

implemented in the cable applications layer 210), it is forwarded to the IP stack 220. If the external packet is destined for a device in the local network, then it is forwarded into the local network through the appropriate local network interface (for example, the Ethernet driver 240) attached to the bridge 230. The residential gateway processing (i.e. packet filtering, address translation, firewall, etc.) may be applied prior to the packet being forwarded to the local network interface."); *id.* at ¶ [0035]

Furthermore, Humpleman, for example, discloses, at 3:24-27, "Communication with the outside world is performed through a number of separate network interface units (NIU's) 32 and may be combined physically in an entrance unit 30, with each network interface unit 32 permitting a connection between a different external network and the home network 10. The different external networks may carry different types of signals. These may be, for example, broadcast signals (digital or mixed analog/digital) carried on hybrid fiber coax or cable. Other types of signals are ISDN, broadcast/digital satellite service, FTTC, FTTH, ADSL, and others. At least the following data types may be carried: compressed video, compressed audio, compressed internet WWW graphics and data, internet e-mail and other data, computer file data and control message data." *See also id*. at 4:46-54 ("An exemplary model of the installation of the home network 10 of the present invention within a house 36 is depicted in FIG. 2. The home network 10 is a long range backbone capable of up to 100 m cable runs, for example, from a switched hub 38 that forms part of the internal network 34. In the exemplary installation depicted in FIG. 2, the entrance unit 30 with its multiple network interface units 32 are located in a utility area of the house, along with the switched hub 38.").

Furthermore, Brooks discloses, for example, at ¶ [0044], "An Ethernet external datalink is also coupled to the APB 214, and is comprised of an Ethernet media access controller (EMAC)

16

226 and the MII 126. In the disclosed embodiment of the invention, the EMAC 226 supports the MAC sublayer of the IEEE 802.3 specification and allows it to be connected to an IEEE 802.3 10/100 Mbps (100Base-T and 10Base-T) MII compatible EPHY device or seven-wire HomeLan PHY device. The MII 126 provides a port to transmit and receive data that is media independent, multi-vendor interoperable, and supports all data rates and physical standards. The port consists of datapaths that are generally four bits wide in each direction, as well as control and management signals. The MII 126 can be configured as a glueless connection to support Ethernet or HomeLan serial mode.").

In addition, Dong teaches a "multi-media terminal adapter [that] may include a datalink layer router coupled to the communication link interface." Dong ¶ 20. Dong also discloses a network access module Such as a cable modem 26 coupled to the HFC network 12 and a stand alone multi-media terminal adapter (MTA)30 coupled to the cable modem 26 via a communication link 34." *Id.* ¶ 38. Dong further teaches "a system and method for the MTA 30 and the cable modem 26 to exchange bandwidth management instructions and acknowledgements that enable the multi-media terminal adapter 30 to control or instruct the cable modem 26 to reserve, commit and delete time division logical channels over the HFC network 12." *Id.* ¶ 41. The MTA "comprises a communication link interface 44, datalink router 45, a network layer router 47, a bandwidth management module 48, a LAN interface 52, and a PSTN interface 54." *Id.* ¶ 69.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

17

b)   "a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine, the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput" (Claim 18)

To the extent that it is determined that any of the above references do not disclose "a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine, the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Brooks discloses, at ¶ [0024] "FIG. 1 is a block diagram of an exemplary cable modem device 100 having a programmable cable media access controller (hereinafter

18

referred to as a programmable MAC) in accordance with the present invention. The cable modem device 100 permits MAC functions to be programmed to support evolving standards, such as DOCSIS, without concomitant hardware upgrades. The disclosed circuitry may be part of a single integrated circuit, or a combination of integrated circuits. Alternatively, host system circuitry may be leveraged to perform certain of the functions described below". *See also id*. at ¶ [0042] ("As previously mentioned, a number of physical interfaces to external data sources are coupled to the APB 214. In particular, a cable media access controller (CMAC) 224, including a system timer and interfaces to the cable downstream PHY circuitry 114 and cable upstream PHY circuitry 118, is provided to support communications with a cable media 134. The CMAC 224 hardware and firmware combine to support a desired specification (e.g., a DOCSIS feature set for the MAC sub-layer of an MCNS cable modem). In general, CMAC 224 aligns incoming packets and prepends a time stamp and appends a pattern recognition trailer structure to form word packets to be delivered to memory by the DMA controller 212. The CMAC 224 is also responsible for requesting data from the DMA controller 212 at the appropriate time, calculating checksums, and encrypting all or part of the upstream data and bursting the data to the upstream cable upstream PHY circuitry 118. Exemplary details of the later operation are provided in the previously-incorporated patent application entitled 'Method and Apparatus for Upstream Burst Transmission Synchronization in Cable Modems.' Delta sigma converter circuitry 228 is also coupled to the CMAC 224 to provide automatic gain control and other functionality for the cable PHY layer").

Moreover, Humpleman discloses, for example, at 3:24-37, "Communication with the outside world is performed through a number of separate network interface units (NIU's) 32 and may be combined physically in an entrance unit 30, with each network interface unit 32 permitting a connection between a different external network and the home network 10. The different external

19

networks may carry different types of signals. These may be, for example, broadcast signals (digital or mixed analog/digital) carried on hybrid fiber coax or cable. Other types of signals are ISDN, broadcast/digital satellite service, FTTC, FTTH, ADSL, and others. At least the following data types may be carried: compressed video, compressed audio, compressed internet WWW graphics and data, internet e-mail and other data, computer file data and control message data"); *see also id.* at 9:50-10:3 ("The separation of the network interface unit 32 from the set-top electronics 40 provides a number of advantages, as described earlier. The functions (responsibilities) of the conventional set-top boxes with integrated network interface units are divided in embodiments of the present invention. For example, in preferred embodiments, the network interface unit 32 is responsible for performing external network specific interfacing, tuning demodulation, and error correction. It provides external network specific video descrambling and encryption/decryption (credit card number, user password, etc.). The network interface unit 32 also provides an external network specific program guide. Additionally, it performs MPEG transport demultiplexing to a single stream and MPEG reference clock recovery. In preferred embodiments of the invention, the network interface unit provides home network. Ethernet interfacing and MPEG/Ethernet clock locking. It also provides the software to support the external network and home network protocols for multiple streams and multiple users. The network interface unit also has the software to act as the gateway for the home network and control the buffering of data as necessary.")

Schain, for example, discloses at ¶ [0060], "Carried in the communications channel is a data/information stream (typically, a bi-directional stream) that contains the actual information being received and transmitted by the computer(s) and digital device(s) connected to the broadband gateway 500. The information stream is forwarded to a DOCSIS MAC/PHY layer processor 510,

20

where the information stream (in its encoded form) is converted into a standardized data format, such as a data packets or even a raw data stream that can be used by the devices connected to the broadband gateway 500. For example, the DOCSIS MAC/PHY layer processor 510 can provide a stream of Ethernet packets with IP packets encapsulated therein. In addition to the format conversion, the DOCSIS MAC/PHY processor 510 can perform tasks such as low-level error detection and correction and encryption and decryption. Note that should the broadband medium be different from coaxial cabling, a different MAC/PHY processor would be used. The converted information stream is provided to a common bus 515 by the DOCSIS MAC/PHY processor 510. The common bus 515 is used by devices and functional units in the broadband gateway 500 to share and exchange control information and data" *See also id.* at ¶ [0065] ("Referring now to FIG. 6, a block diagram illustrates a single board implementation of the broadband gateway 605 according to a preferred embodiment of the present invention. The broadband gateway 605 includes a tuner 610 that is coupled to a DOCSIS MAC/PHY processor 615. An example of a DOCSIS MAC/PHY processor 615 that would be usable in the broadband gateway 605 would be a Texas Instruments TNETC 4042 integrated MAC/PHY integrated circuit. The TNETC 4042 is certified for DOCSIS technical standard version 1.1. Coupled to the DOCSIS MAC/PHY 615 is a processing element 620. An example of a processing element 620 would be a Texas Instruments TNETC 4305. The TNETC 4305 is a processor with built in communications peripherals. Finally, coupled to the processing element 620 are a series of integrated circuits used to provide connectivity to the broadband gateway 605. These circuits include a USB interface circuit 625 and an Ethernet interface circuit 630. Should the broadband gateway 605 offer wireless connectivity through an IEEE 802.11 wireless Ethernet network, the broadband gateway 605 would also have a wireless interface circuit 635. An example of a wireless interface circuit 635 would be a Texas

21

Instruments ACX-100. The ACX-100 is a single-chip MAC controller with an IEEE 802.11b compliant baseband processor. Also present, but not shown in FIG. 6, is a block of memory. The memory can be used to store code and as buffers for data arriving at and leaving the broadband gateway.").

Dong further discloses, by way of example, "a system 10 for providing both Voice communications and Internet data connectivity to a subscriber over a frame Switched network such as a hybrid fiber/cable (HFC) network 12. The system 10 comprises a network controller Such as a cable modem termination server (CMTS) 20, an Internet gateway 22, and a call agent 24 interconnected by a managed IP network 14." Dong ¶ 35; *see also id.* ¶ 46 ("The DOCSIS interface 40 utilizes the known DOCSIS protocols for communicating with the CMTS 20 over the HFC network 12. The communications may include exchanging IP frames that are part of IP sessions between the MTA3 0 and a remote internet server; IP frames that are part of VoIP sessions between the MTA 30 and the call agent 24, and DOCSIS-DOOS control commands between the cable modem 26 and the CMTS 20."); ¶ 47 ("The service flow module 38 includes buffers 39. The service flow module receives the IP traffic sent by the MTA on the communication link 34 and receives frames representing DOCSIS DOoS commands from the QoS application. All frames received by the Service flow module 38 may be stored in buffers 39 and sorted such that each frame can be delivered to the DOCSIS interface 40 at a time applicable for transmission of the frame on the HFC network 12 within the appropriate time division logical channel. The Sorting is performed with reference to a Service flow table 108 for identifying the various time division logical channels that currently exist between the cable modem 26 and the CMTS 20 Over the HFC network 12 and a discrimination table 106 for identifying which frames are to be transmitted within which time division logical channels and a Service flow table.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

        c)   **"a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine" (Claim 18)**

To the extent that it is determined that any of the above references do not disclose "a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Brooks discloses "FIG. 2 is a schematic block diagram providing exemplary details of the cable modem device 100 of FIG. 1. In this embodiment of the invention, the cable modem device 100 utilizes the Advanced System Bus (ASB 210) and Advanced Peripheral Bus (APB 214) protocol and bus architecture as specified in the Advanced Microcontroller Bus Architecture (AMBA) specification. The AMBA specification defines an on-chip communication standard for designing high-performance embedded microcontrollers. The ASB 210 is generally utilized for high-performance system modules, supporting the efficient connection of processors, on-chip memories, and off-chip external memory interfaces with low-power peripheral/macrocell functions. The APB 214 is generally utilized with low-power peripherals, and is optimized for minimal power consumption and reduced interface complexity in supporting peripheral functions." Brooks at ¶ [0032]. *See also id.* at ¶ [0034] ("An ASB-APB bridge/centralized DMA

23

controller 212 is provided for linking the ASB 210 to the lower bandwidth APB 214, where most of the peripheral devices in the cable modem device 100 are located. As discussed in greater detail below, the ASB-APB bridge/centralized DMA controller 212 is both an ASB 210 master and an APB 214 master, and utilizes burst transfers and pipelining of data to optimize bus efficiency."; *id*. at ¶ [0035] ("The APB 214 provides the basic peripheral macrocell communications infrastructure. Such peripherals typically have interfaces which are memory-mapped registers, have few high-bandwidth interfaces, and are accessed under program control (such as the programmable MAC). In the disclosed embodiment of the invention, certain performance enhancements have been made to the APB and ASB, as well as the device interfaces to these buses, as set forth in greater detail in previously incorporated patent applications entitled, 'System and Method for Providing an Improved Synchronous Operation of an Advanced Peripheral Bus with Backward Compatibility', and 'Asynchronous Centralized Multi-Channel DMA Controller'."

Humpleman discloses, for example, "[t]he digital signals are distributed throughout the home over an internal network 34. In certain preferred embodiments, the internal network 34 is essentially Ethernet of type 10base-T or 100base-T twisted pair but a special switch hub is employed to make the network scalable to any number of terminal units each able to receive high bit-rate video." Humpleman at 3:55-61. *See also id.* at 5:6-26 ("The present invention, as shown in FIGS. 1 and 2, separates the functionality of the network interface units 32 from the set-top electronics 40. Conventionally, a set-top box contains a network interface unit whose components are internally connected by a bus to the set-top electronics components. By contrast, however, the present invention provides a separation of the network interface units 32 and the set-top electronics 40, with the internal network 34 interposed therebetween. This arrangement permits multiple set-top electronics to be distributed throughout the home 36 less expensively, since the electronics of

a network interface unit do not have to be duplicated for each set-top electronics. Additionally, having separate network interface units 32 coupled to different external networks and to a common internal network 34 frees the homeowner from being forced to receive all programming from a single source, such as the telephone or cable company. The separation also allows the homeowner to add, drop or change services simply by changing one of the network interface units 32, without the need for replacing all of the set-top electronics 40 throughout the home 36.").

Furthermore, Schain discloses, for example, at ¶ [0048], "When packets need to cross the local network and external network interface, i.e., a packet with a local network source address and an external network destination address (and vice versa, a packet from an external device with the destination address being the global NAT address pertaining to an internal device's address), a virtual data link 350 connecting the local bridge 345 to the cable bridge 315 (and vice versa) is used. The virtual data link 350 permits packets needing to cross the interface to move from one portion of the broadband gateway 135 to the other. For example, a local packet addressed to some destination in the external network will cross the virtual data link 350 and enter the cable bride 315. According to a preferred embodiment of the present invention, packet filtering (including address filtering) and network address translation can be performed in the virtual data link 350. The virtual data link 350 is a natural place to perform the packet filtering and network address translation due to its position in the partition of the two bridges. This will be done either internally within the virtual data link 350 or by the virtual data link providing the packet to a dedicated module for packet processing (e.g. NAT and firewall modules). After entering the cable bridge 315, the packet is injected into the external network via the cable driver 310." *See also id.* at ¶ [0051] ("Use of the virtual data link 350 permits the logical separation of the two bridges 315 and 345 while permitting the sharing of the same IP stack 320. By keeping the two bridges separate,

25

the processing of external and local packets can be kept separate. The separation of the bridges can even allow each bridge to be implemented using separate modules, even if the modules are executing on the same processing element. Through the use of separate modules, interaction between the processing performed by the two bridges is reduced. Typically, when applications are implemented as separate modules, interaction can only be achieved via specified methods and not by arbitrary methods developed by the creator of the applications such as illegal accesses to a shared memory, therefore, interaction between the modules are reduced and controlled. By reducing the interaction, there is a reduced chance of errors resulting from unintended corruption of data and memory. The reduction in the interaction between the modules also permits better balancing the processing resources allocated to the processing of the external packets and local packets in the respective bridges. This makes it easy to achieve maximum overall processing rate and efficiency.") *id*. at ¶ [0060] ("For example, the DOCSIS MAC/PHY layer processor 510 can provide a stream of Ethernet packets with IP packets encapsulated therein. In addition to the format conversion, the DOCSIS MAC/PHY processor 510 can perform tasks such as low-level error detection and correction and encryption and decryption. Note that should the broadband medium be different from coaxial cabling, a different MAC/PHY processor would be used. The converted information stream is provided to a common bus 515 by the DOCSIS MAC/PHY processor 510. The common bus 515 is used by devices and functional units in the broadband gateway 500 to share and exchange control information and data.").

Dong further describes a "communication link interface 36 utilizes one of a plurality of known physical layer protocols for exchanging frames with the MTA30 over the communication link 34. Exemplary protocols include Universal Serial (USB) and Ethernet. The frames transferred between the communication link 36 and the MTA 30 may be IP traffic (e.g. IP sessions between a

26

data client 58 and a remote Internet server or VoIP signaling or media sessions between the MTA 30 and the call agent 24) or may be bandwidth management frames (e.g. general management information, bandwidth management instructions, and acknowledgements) transferred between the MTA 30 and the OOS module 42." Dong ¶ 44; *see also id.* ¶ 51 ("The communication session with the MTA 30 is established using discovery processes similar to those utilized by the point-to-point over Ethernet (PPoE) standard. More specifically, Step 114 represents receiving a broadcast discovery message from the MTA 30 that is routed to the QoS module 42 by the datalink layer router 41 because it includes an EtherType that distinguishes it from frames to be routed to the service flow module 38 (e.g. EtherType field 0xAAO1). The MAC address of the MTA30 will be included within the discovery message."); ¶ 53 ("Once the session is established, at various times a management event will occur. The MTA30 will periodically send a "heart beat' message to the cable modem 26 which enables the MTA30 to periodically verify that the session has not been interrupted. Receipt of a "heartbeat' message is a management event. Other management events include determining that a time of day message should be sent to the MTA 30, determining that a Syslog ID message should be sent to the MTA30, and determining that a DHCPID should be sent to the MTA30. Step 112 represents a determination if management event has occurred. If yes, Step 113 represents responding to the MTA 30 with an appropriate management message.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

27

> **d)**   **"wherein all DOCSIS functions are localized in the cable modem engine" (Claim 19)**

To the extent that it is determined that any of the above references do not disclose "wherein all DOCSIS functions are localized in the cable modem engine," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Brooks, for example, teaches "[b]ifurcated microprocessor architecture, in which first processing circuitry is programmed to implement MAC functionality for processing information flowing to and from cable media interface circuitry, and second embedded processor core or host system processor provides operating system functionality are used. Alternatively, separate processor cores provide MAC functionality for downstream and upstream data paths, respectively. Cable media interface circuitry, and other peripheral circuitry, are coupled to a peripheral bus that is linked by a bridge circuit to a system bus. The processing circuitry MAC is communicatively coupled to the system bus. Centralized DMA control directs data transfer between the peripheral and system buses as determined, at least in part, by the programmable MAC." Brooks at Abstract. *See also id.* at ¶ [0014] ("The cable modem device of a disclosed embodiment of the invention utilizes a bifurcated microprocessor architecture in which first processing circuitry (e.g., an embedded processor core) is programmed to implement the desired MAC functionality for processing information flowing to and from cable media interface circuits. A second embedded processor core or host system processor provides operating system functionality and controls the boot process for the first embedded processor core. In a further embodiment, separate processor cores are provided for implementing MAC functionality for the downstream and upstream data paths, respectively.").

Furthermore, Humpleman, for example, discloses, "an arrangement in which the set-top electronics that support the media output devices, such as televisions, are separate from the network interface units that interface to external networks. The separation of the network interface unit functions from the set-top electronics allows a single network interface unit to be used to interface with an external network and provide programming selectively to a multitude of set-top electronics and televisions within the home. This reduces the need for duplication of the network interface functions at each television or other end product. (media output device) and thereby reduces the costs for the typical homeowner who will have more than one television set in the home. Further, having multiple separate network interface units on the network allows the consumer to pick and choose among available services, and not be constrained to a single service provider. Changing a service may be performed simply by exchanging or adding a different network interface unit configured to interface with the new external network." Humpleman at 2:10-30. *See also id.* at 5:6-22 ("The present invention, as shown in FIGS. 1 and 2, separates the functionality of the network interface units 32 from the set-top electronics 40. Conventionally, a set-top box contains a network interface unit whose components are internally connected by a bus to the set-top electronics components. By contrast, however, the present invention provides a separation of the network interface units 32 and the set-top electronics 40, with the internal network 34 interposed therebetween. This arrangement permits multiple set-top electronics to be distributed throughout the home 36 less expensively, since the electronics of a network interface unit do not have to be duplicated for each set-top electronics. Additionally, having separate network interface units 32 coupled to different external networks and to a common internal network 34 frees the homeowner from being forced to receive all programming from a single source, such as the telephone or cable company.").

Schain, for example, teaches, at ¶ [0006], "[a] fairly common solution to the processing of external and local packets is to create two separate modules that are separately responsible for processing external packets and local packets. By separating the processing, it is much less likely that there would be interference since there is no interaction unless a packet crosses the interface. However, the separation of the processes can result in unnecessary duplication of modules, such as the communications protocol modules." *See also id.* at ¶ [0042] ("Although the twin bridge logical architecture displayed in FIG. 2 b is shown as being a part of a broadband gateway 135, an advantage of the twin bridge architecture is that the two bridges can be implemented in separate devices, i.e., the cable modem portion of the twin bridge architecture can simply be a cable modem while the residential gateway portion can simply be a residential gateway. The Ethernet interface module 255 (or some other type of interconnect, either wired or wireless) would then be connecting both devices through appropriate network interface drivers in the two physically coupled devices.").

Dong further discloses that "[t]he cable modem 26 may include a DOCSIS interface 40, a QoS module 42, a service flow module 38, a datalink layer router 41, and a communication link interface 36." Dong ¶ 35; *see also* ¶ 46 ("The DOCSIS interface 40 utilizes the known DOCSIS protocols for communicating with the CMTS 20 over the HFC network 12. The communications may include exchanging IP frames that are part of IP sessions between the MTA3 0 and a remote internet server; IP frames that are part of VoIP sessions between the MTA 30 and the call agent 24, and DOCSIS-DOOS control commands between the cable modem 26 and the CMTS 20."); ¶ 48 ("The QoS module 42 operates as a slave to the MTA 30 by receiving bandwidth management instructions from the MTA 30 and making appropriate DOCSIS DooS request to the CMTS 20 in response to the bandwidth management instructions. Further, the QoS module 42 exchanges

30

management information with the MTA30 such as "heart beat' messages and responses, time of day messages, DHCP ID messages, and Syslog ID messages.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B.   Invalidity of the '775 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '775 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '775 Patent are invalid for failure to provide a written description that enables the full scope of the asserted claims and demonstrates that the inventor had possession of the claimed invention based on at least the following claim terms, phrases, or limitations:

- "a first circuit that includes at least one processor " (claim 18)

  o   The terms "first circuit" and "circuit" do not appear and are not described anywhere in the specification or drawings of the '775 Patent. For at least this reason, the written description of the '775 Patent thus fails to demonstrate that the inventor had possession of the claimed subject matter and fails to enable a person of ordinary skill in the art to make, use, or practice the full scope of the claimed subject matter without undue experimentation.

- " a second circuit that includes at least one processor " (claim 18)

  o   The terms "second circuit" and "circuit" do not appear and are not described anywhere in the specification or drawings of the '775 Patent. The written description of the '775 Patent thus fails to demonstrate that the inventor had possession of the claimed subject matter and fails to enable a person of ordinary skill in the art to make, use, or practice the full scope of the claimed subject matter without undue experimentation.

31

- "the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine " (claim 18)

    o The specification and drawings of the '775 Patent do not set forth any description as to how the cable modem engine enables upgrades of any software, thereby failing to demonstrate that the inventor had possession of the claimed subject matter.

- "wherein all DOCSIS functions are localized in the cable modem engine" (claim 19)

    o The specification and drawings of the '775 Patent do not set forth a description of the term "DOCSIS functions." The written description of the '775 Patent thus fails to demonstrate that the inventor had possession of the claimed subject matter and fails to enable a person of ordinary skill in the art to make, use, or practice the full scope of the claimed subject matter without undue experimentation.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C.   Invalidity of the '775 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '775 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '775 Patent are invalid for reciting at least the following claim terms, phrases, or limitations:

- "a data networking engine implemented in a first circuit that includes at least one processor…" (claim 18)

    o This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit…" (claim 18)

- o This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "data bus" (claim 18)

  - o This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "DOCSIS MAC processor"

  - o This term is indefinite under 35 U.S.C. § 112, ¶ 2 unless it is construed as the DOCSIS MAC processor described in the '775 Patent's specification (*see, e.g.*, '775 Patent at 3:1-20; 4:41-57; *id.* at FIGs. 1 & 2), as discussed in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "DOCSIS controller"

  - o This term is indefinite under 35 U.S.C. § 112, ¶ 2 unless it is construed as the DOCSIS controller as described in the '775 Patent's specification (*see, e.g.*, '775 Patent at 3:21-48; 4:41-57; *id.* at FIGs. 1 & 2), as discussed in Defendant's Responsive Claim Construction Brief (Dkt. 104).

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, thus violate the definiteness requirements of 35 U.S.C. § 112.

IV.   THE '690 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits B1 through B7[3] and/or described below anticipate and/or render obvious, alone or in combination, one or more of the asserted claims of the '690 Patent.

1.   The '690 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '690 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits B1 through B7 which identify specific examples of where each limitation of the asserted

---

[3] Exhibits B1-B6 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references as anticipating one or more of the asserted claims of '690 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '690 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

a)   Prior Art Patents and Publications

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent No. 7,895,632	February 22, 2011	Sadja	B1
U.S. Patent App. Pub. No. 2007/0286143 A1	December 13, 2007	Olson	B2
U.S. Patent App. Pub. No. 2005/0088980 A1	April 28, 2005	Olkkonen	B3
U.S. Patent App. Pub. No. 2012/0106452 A1	October 28, 2010	Kneckt	B4
U.S. Patent App. Pub. No. 2008/0298333 A1	December 4, 2008	Seok	B5
U.S. Patent App. Pub. No. 2007/0047492 A1	March 1, 2007	Kim	B6
Data-Over-Cable Service Interface Specifications, DOCSIS 2.0, Radio Frequency Interface Specification, Document Control No. CM-SP-RFIv2.0-I12-071206	December 6, 2007	DOCSIS 2.0	B7

b)   Prior Art Systems

Defendant's further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional information about relevant prior art systems. Defendant reserves the right to further supplement these Invalidity Contentions based on subsequent investigation and discovery, including from third parties. In particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendant further reserves the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendant also incorporates by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '690 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

* * * * *

To the extent any prior art reference set forth above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '690 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '690 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '690 Patent is not explicitly disclosed by any prior art identified above and/or in Exhibits B1 through B7, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits B1 through B7 with each other, at least because all of these references relate to the use of probes, probe requests, and polling messages in computer networks, such as, for example, cable television networks and wireless local area networks. The references set forth above are therefore all in the same or similar fields of endeavor.

For example, U.S. Patent. No. 7,895,632 ("Sadja") teaches a "cable television diagnostic method for a cable television network [that] involves sending a polling message to a plurality of modems forming a part of a plurality of television set top boxes from a cable television headend via a cable television cable connection to the set top boxes; wherein the polling message instructs the cable television set top boxes to obtain at least one operational parameter of each of the television set top boxes; receiving a plurality of response messages from the cable television set top boxes, each containing the at least one operational parameter of the television set top boxes; determining that one of the operational parameters from one of the television set top boxes is outside of a specified range of values; and aggregating the operational parameters of the plurality of set top boxes received in the response messages to determine if the same operational parameter is outside the range of specified values for more than the one of the television set top boxes." Sadja at Abstract.

Furthermore, U.S. Patent Application Publication No. 2007/0286143 A1 ("Olson") teaches a "method, an apparatus, and a software program to implement a method to detect a rogue access point of a wireless network. . . . The method . . . includes sending a scan request to one or more managed APs, including one or more of a request for the receiving managed AP to scan for beacons and probe responses and a request for the receiving managed AP to request its clients to scan for beacons and probe responses. The method further includes receiving reports from at least one of the receiving managed APs, a report including information on any beacon or probe response received that was sent by an AP. For each beacon or probe response on which information is received, the method analyzes the information received in the report about the AP that sent the beacon or probe response, the analyzing including ascertaining if the MAC address of the AP that sent the beacon or probe response matches a MAC address of an AP in the AP database to ascertain whether or not the AP is a potential rogue AP or a managed or friendly AP." Olson at Abstract.

Additionally, U.S. Patent Application Publication No. 2005/0088980 A1 ("Olkkonen") discloses "[in] order for a IEEE 802.11 mobile station to communicate with other mobile stations in an ad hoc network, it must first find the stations. The process of finding another station is by inquiring. Active inquiry requires the inquiring station to transmit queries and invoke responses from other wireless stations in an ad hoc network. In an active inquiry, the mobile station will transmit a probe request frame. If there is an ad hoc network on the same channel that matches the service set identity (SSID) in the probe request frame, a station in that ad hoc network will respond by sending a probe response frame to the inquiring station. The probe response includes the information necessary for the inquiring station to access a description of the ad hoc network. The inquiring station will also process any other received probe response and Beacon frames." Olkkonen at ¶ [0014].

37

Further, U.S. Patent Application Publication No. 2012/0106452 A1 ("Kneckt") discloses "receiving, by a broker station in a wireless network, a broker activation request message from a first client station, the broker activation request message comprising wireless networking capabilities of the first client station. The method may also include sending a networking capability message to at least one other client station, the network capability message comprising identifier and wireless network capabilities of the first client station, the networking capability message being based at least partly on the broker activation request message." Kneckt at Abstract.

In addition, U.S. Patent Application Publication No. 2008/0298333 A1 ("Seok") teaches "a scan procedure in a wireless local access network, and station and frame format for the scan procedure. In the scan procedure, a second station receives from a first station a probe request frame. . . . [T]he second station transmits a probe response frame to the first station in response to the probe request frame." Seok at Abstract.

Further, U.S. Patent Application Publication No. 2007/0047492 A1 ("Kim") teaches a "mobile station 1 transmits a probe request frame to detect a new access point, and the first and second access points 21 and 22 receive the probe request frame (71). That is, active scanning in which a mobile station spontaneously transmits a probe request frame to detect an access point is performed." Kim at ¶ [0051]. Kim further discloses "the first access point 21 transmits the extended probe response frame of FIG. 8 to the mobile station 1 in response to the probe request frame received in operation 71, and the mobile station 1 receives the extended probe response frame (73). Then, channel scanning between the first access point 21 and the mobile station 1 is terminated." *Id*. at ¶ [0054].

Further, Data-Over-Cable Service Interface Specifications, DOCSIS 2.0, Radio Frequency Interface Specification, Document Control No. CM-SP-RFIv2.0-I12-071206 ("DOCSIS 2.0"0

38

teaches a "Test Request is used to force a CM to enter or leave one of two test modes." DOCSIS

2.0 at 184. The Test Request instructs a cable modem to "[t]ransmit a continuous (non-bursted)

upstream signal at the commanded modulation rate, carrier frequency, and power level. The chip

sequence at the spreader output is replaced with an alternating binary sequence (1, -1, 1, -1, 1, -1,

…) at nominal amplitude." *Id.* at 185. Alternatively, the test request instructs a cable modem to

"[t]ransmit a continuous (non-bursted) unmodulated (CW) upstream signal at the commanded

carrier frequency, modulation rate and power level. This is equivalent to replacing the chip

sequence at the spreader output with the constant sequence (1, 1, 1, 1, 1, …) at nominal amplitude."

Id.

Accordingly, because the identified references are directed to similar devices in similar

fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the

teachings of two or more references with a reasonable expectation of success.

a) **"receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify content payload of the probe and a second node" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose

"receiving in a first node, a probe request specifying a first plurality of parameters associated with

the generation and transmission of a probe, wherein the first plurality of parameters at least specify

content payload of the probe and a second node," as claimed, it would have been obvious to modify

the teachings of that reference to include this feature at least in view of the following exemplary

teachings[4].

---

[4] The teachings set forth below are also applicable to "a first node transmitting a probe request to a second node, the probe request specifying a first plurality of probe parameters for a physical layer probe," as recited in Claim 9 and "the first node transmitting a second probe request to a third node," as recited in Claim 11.

For example, Sadja, for example, teaches, at 14:44-56, "At 708, the system selects a set top box for polling, and at 712, that set top box is polled for conditional access information or other information that can be used to detect theft of service. One example is to poll the set top box for a channel to which the set top box is currently tuned. If the channel is an unauthorized channel, the cable system operator can deduce that the user of the set top box is somehow obtaining unauthorized access to such channels. Similarly, in some embodiments of set top boxes, it may be possible to poll for codes that actually describe the conditional access rights that have been purchased by the user of the set top box. In either case, that information is retrieved from the set top box by way of polling at 712."

In addition, Olson, for example, teaches that "a wireless network uses management frames at the MAC layer designed, sent, and received for management purposes. For example, in a WLAN that conforms to the IEEE 802.11 standard, an AP regularly transmits beacon frames that announce the AP's presence, i.e., advertises the AP's services to potential clients so that a client may associate with the AP. Similarly, a client can send a probe request frame requesting any AP in its radio range to respond with a probe response frame that, in a similar manner to a beacon frame, provides information for the requesting client (and any other radios in its radio range and able to receive its channel) sufficient for a client to decide whether or not to associate with the AP." Olson at ¶ [0051].

Similarly, Olkkonen, for example, discloses "[i]n order for a IEEE 802.11 mobile station to communicate with other mobile stations in an ad hoc network, it must first find the stations. The process of finding another station is by inquiring. Active inquiry requires the inquiring station to transmit queries and invoke responses from other wireless stations in an ad hoc network. In an active inquiry, the mobile station will transmit a probe request frame. If there is an ad hoc network

on the same channel that matches the service set identity (SSID) in the probe request frame, a station in that ad hoc network will respond by sending a probe response frame to the inquiring station." Olkkonen at ¶ [0014].

Furthermore, Kneckt, for example, discloses "FIG. 9B is a block diagram showing a capability request 208 according to another example embodiment. According to this example, the capability request 208 may include a probe request. The capability request 208 or probe request may include, for example, an SSID field 924, a supported rates field 926, a request information field 928, an extended supported rates field 930, and a vendor specific field 932. The request information field 928 subfields including, for example, any or all of the subfields of the requested network types field 906 described above with reference to FIG. 9A." Kneckt at ¶ [0076].

Seok, for example, discloses "an active scanning method. In this method, a non-AP STA hoping to be a member of a specific ESS first transmits a probe request frame. The probe request frame contains specific service information requested by the non-AP STA. The APs having received the probe request frame transmit a probe response frame to the non-AP STA in response to the received probe request frame. The probe response frame includes a variety of information required for network access through the APs. Accordingly, the non-AP STA can acquire a list of associable APs from the received probe response frame." Seok at ¶ [0011].

DOCSIS 2.0, for example, discloses a "Test Request is used to force a CM to enter or leave one of two test modes." DOCSIS 2.0 at 184. The Test Request instructs a cable modem to "[t]ransmit a continuous (non-bursted) upstream signal at the commanded modulation rate, carrier frequency, and power level. The chip sequence at the spreader output is replaced with an alternating binary sequence (1, -1, 1, -1, 1, -1, …) at nominal amplitude." *Id.* at 185. Alternatively, the test request instructs a cable modem to "[t]ransmit a continuous (non-bursted) unmodulated

41

(CW) upstream signal at the commanded carrier frequency, modulation rate and power level. This is equivalent to replacing the chip sequence at the spreader output with the constant sequence (1, 1, 1, 1, 1, …) at nominal amplitude." *Id.*

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

   b)   "determining a second plurality of parameters associated with generation and transmission of the probe" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "determining a second plurality of parameters associated with generation and transmission of the probe," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.[5]

Sadja, for example, discloses "[a]t 616, the set top box begins monitoring the data channel using the DOCSIS modem to await a polling query from the cable system headend. During its operation, the set top box may update its memory with the latest operational parameters which might include the calculated short-term and long-term averages of certain data such as bit error rates or amplifier gains. If a poll is received at 626, control passes to 630 where the poll query is parsed to determine what data are being requested in the poll. The requested data are then retrieved from memory or from an appropriate storage register at 634, and a response is transmitted to the cable system headend at 640." Sadja at 13:48-59.

---

[5] The teachings set forth below are also applicable to "wherein the probe is generated in accordance with the first plurality of parameters and in accordance with a second plurality of parameters determined by the second node," as recited in Claim 9.

Olson, for example, discloses that "[t]he beacon/probe response information sent includes one or more of: The SSID in the beacon or probe response. Beacon time (TSF timer) information. In one embodiment, this is sent in the form of TSF offset determined by comparing the timestamp in the beacon/probe response with the TSF timer at the managed AP receiving the response or at the managed client receiving the response. Configuration parameters included in the received beacon/probe response." Olson at ¶ [0071].

Furthermore, Olkkonen, for example, discloses "a station in that ad hoc network will respond by sending a probe response frame to the inquiring station. The probe response includes the information necessary for the inquiring station to access a description of the ad hoc network." Olkkonen at ¶ [0014]. *See also id.* at ¶ [0211] ("when an arriving IEEE 802.11 wireless device arrives within the communication range of any member of an IEEE 802.11 ad hoc network 102(I), its probe request frame 560(I) inquiry signals are answered by a member of the ad hoc network 102(I) detecting the inquiry. If the responding member is an ad hoc network information provider 106(I), it responds with a probe response 570(I) containing a service attribute response 577(I) with information accessed from its memory characterizing the ad hoc network.").

As another example, Kneckt discloses, at ¶ [0038], "[t]he client stations 106, 108, 110, 112, 114, 116 may receive more detailed information about the wireless networking or communication capabilities of one or more other client stations 106, 108, 110, 112, 114, 116 by sending a capability request message 208 to the broker station 104 via the air interface, to which the broker station 104 may respond by sending a network capability message, such as a capability response message to the respective client station 106, 108, 110, 112, 114, 116. The capability response message may include more detailed information about the requested client station 106, 108, 110, 112, 114, 116 than the networking service announcement message." *See also id.* at ¶ [0040] ("The requests and

43

responses between the requesting client station 106 and the requested client station 108 may also allow the requesting client station 106 and requested client station 108 to select the optimal networking or communications protocol for their communication. For example, the requesting client station 106 and/or the requested client station 108 may select an optimal wireless networking or communication protocol based on throughput, power consumption, and/or forwarding capabilities.")

Seok, for example, discloses "[t]he probe response frame includes a variety of information required for network access through the APs. Accordingly, the non-AP STA can acquire a list of associable APs from the received probe response frame." Seok at ¶ [0011]. *See also id.* at ¶ [0060] ("The request information element is used to specify information pieces which are requested to be contained in the probe response frame by the response STA, for example, the AP 4.").

Further, Kim, for example, teaches "FIG. 8 is a view illustrating the construction of an extended probe response frame according to an exemplary embodiment of the present invention. Referring to FIG. 8, the probe response frame is a management frame according to the IEEE 802.11 standard. A frame body field of the probe response frame includes a timestamp field 81, a beacon interval field 82, a capability information field 83, an SSID field 84, a supported rates field 85, an FH parameter set field 86, a DS parameter set field 87, a CF parameter set field 88, and an IBSS parameter set field 89." Kim at ¶ [0057].

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

c)   **"generating the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "generating the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.[6]

For example, Sadja discloses "[a]nother common remote query method used by equipment manufactures is by performing an HTTP GET request and parsing the response data. The data is returned in either in XML or HTML format, which can easily be parsed and the appropriate data extracted, or the data is returned in HTML, as a diagnostics web page from which the appropriate data can also be parsed and extracted." Sadja at 8:52-58. *See also id.* at 11:61-12:4 ("A cable television diagnostic method for a cable television network consistent with certain embodiments involves sending a polling message to a plurality of modems forming a part of a plurality of television set top boxes from a cable television headend via a cable television cable connection to the set top boxes; wherein the polling message instructs the cable television set top boxes to obtain at least one operational parameter of each of the television set top boxes; receiving a plurality of response messages from the cable television set top boxes, each containing the at least one operational parameter of the television set top boxes"); *id.* at 13:54-59 ("If a poll is received at 626, control passes to 630 where the poll query is parsed to determine what data are being

---

[6] The teachings below are also applicable to "wherein the probe is generated in accordance with the first plurality of parameters and in accordance with a second plurality of parameters determined by the second node," as recited in Claim 9, and "wherein the second probe is generated according to the second probe request, as recited in Claim 11.

requested in the poll. The requested data are then retrieved from memory or from an appropriate

storage register at 634, and a response is transmitted to the cable system headend at 640.").

Olson, for example, teaches, at ¶ [0084], "[a] frame we call the Measurement Report Frame

from the client provides a report in response to a Measurement Request Frame. The Report frame

includes the MAC address of the station providing the report, the identifier from the corresponding

Measurement Request Frame, and one or more measurement elements. The measurement elements

for the case of a beacon or probe response include one or more of the channel number, the duration

over which the beacon/probe response was measured, the PHY type (DSS, 5 GHz OFDM, and so

forth), the RSSI of the beacon/probe response, the parent TSF, e.g., all or some of the lower order

bits of the serving AP's TSF at the time the client received the beacon or probe response, the TSF

in the beacon/probe response, and one or more other elements that are in the received beacon/probe

response frame."

Olkkonen, moreover, teaches, for example, "[t]he effect of receiving a probe request 560(I)

is to cause the station 106(I), for example, to respond with a probe response 570(I) of FIG. 7B. In

accordance with the invention, when an arriving IEEE 802.11 wireless device arrives within the

communication range of any member of an IEEE 802.11 ad hoc network 102(I), its probe request

frame 560(I) inquiry signals are answered by a member of the ad hoc network 102(I) detecting the

inquiry. If the responding member is an ad hoc network information provider 106(I), it responds

with a probe response 570(I) containing a service attribute response 577(I) with information

accessed from its memory characterizing the ad hoc network. If, instead, an ordinary device 108(I)

in an ad hoc network 102(I) is the first to respond to the probe request frame 560(I) inquiry signals

of the arriving device 100(I), the responding device responds with a probe response 570(I)

containing the address of the ad hoc network information provider 106(I)." Olkkonen ¶ [0211].

46

See also id. at ¶ [0229] ("The effect of receiving a probe request 560(I) is to cause the station to respond with a probe response 570(I). The probe response frame contains nearly all the same information as a Beacon frame, including the timestamp, beacon interval, capability information, information elements of the service set identity (SSID), supported rates, one or more physical parameter sets, the optional contention-free parameter set, and the optional ad hoc network parameter set.").

Furthermore, Kneck discloses, for example, "the broker station 104 may respond to receiving the capability request message 208 by sending network capability message, such as a capability response message 210 to the requesting client station 106. The capability response message 208 may [identify] client stations 108, 110, 112 which are capable of communicating with the requesting client station 106 on a peer-to-peer basis via at least one of the wireless networking or communication protocols indicated by the capability request message 206. The capability response message 210 may be based on the compiled wireless networking or communication capabilities." Kneckt at ¶ [0077].

Seok, furthermore, discloses, for example, "all the APs having received the probe request frame from the non-AP STA 2 do not transmit the probe response frame, but only the AP 4 corresponding to values which are set in some fields of the probe request frame having been received and which satisfies the following conditions transmits the probe response frame. Here, some fields may be all or a part of the identification information for identifying an AP or an access network (AN) such as the DS. The AP 4 transmitting the probe response frame is an AP supporting the interworking service, that is, an interworking-capable AP." Seok at ¶ [0068].

In addition, Kim, for example, teaches "the frame body field of the extended probe response frame further includes fields recording information regarding access points that are

47

estimated to be present in the communication area of the mobile station 1, that is, a number of associated stations field 810 recording the number of mobile stations associated with the access point, and a number of frames field 811 recording the number of frames transmitted from or received by the access point for a period of time F." Kim at ¶ [0058]; *see also id.* at ¶ [0057].

DOCSIS 2.0, furthermore, discloses that the cable modem, for example, "[t]ransmit[s] a continuous (non-bursted) upstream signal at the commanded modulation rate, carrier frequency, and power level. The chip sequence at the spreader output is replaced with an alternating binary sequence (1, -1, 1, -1, 1, -1,...) at nominal amplitude, equal on I and Q. The CM tracks the downstream symbol clock and uses it to generate the upstream symbol clock as in normal synchronous operation." DOCSIS 2.0 at 185. Furthermore, the cable modem "[t]ransmit[s] a continuous (non-bursted), unmodulated (CW) upstream signal at the commanded carrier frequency, modulation rate and power level. This is equivalent to replacing the chip sequence at the spreader output with the constant sequence (1, 1, 1, 1, 1, 1,...) at nominal amplitude, equal on both I and Q. The CM tracks the downstream symbol clock and uses it to generate the upstream symbol clock as in normal synchronous operation." *Id.*

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **d)** **"transmitting the probe from the first node to the second node" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "transmitting the probe from the first node to the second node," as claimed, it would have been

obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.[7]

Sadja, for example, teaches "STB 122 can operate in a bidirectional communication mode so that data and other information can be transmitted not only from the system's head end to the end user, or from a service provider to the end user of the STB 122, but also, from the end user upstream using an out-of-band channel. In one embodiment, such data passes the system bus 230 to DOCSIS (Data Over Cable System Interface Specification) compliant modem 244 the diplexer 202 and out the transmission medium 220." Sadja at 4:41-48. *See also id.* at 13:56-62 ("The requested data are then retrieved from memory or from an appropriate storage register at 634, and a response is transmitted to the cable system headend at 640. Control then passes back to 626 to await the next poll. When no poll is received, the set top box simply continues to accumulate data on the modem and set top box performance in the loop defined by 612, 620, 626, and back to 612.").

Olson, moreover, discloses, for example, "in a WLAN that conforms to the IEEE 802.11 standard, an AP regularly transmits beacon frames that announce the AP's presence, i.e., advertises the AP's services to potential clients so that a client may associate with the AP. Similarly, a client can send a probe request frame requesting any AP in its radio range to respond with a probe response frame that, in a similar manner to a beacon frame, provides information for the requesting client (and any other radios in its radio range and able to receive its channel) sufficient for a client to decide whether or not to associate with the AP." Olson at ¶ [0049].

---

[7] The teachings below are also applicable to "the first node receiving the probe from the second node," as recited in Claim 9, and "he first node receiving a second probe from the third node," as recited in Claim 11.

Further, Olkkonen teaches, for example, "when an arriving IEEE 802.11 wireless device arrives within the communication range of any member of an IEEE 802.11 ad hoc network 102(I), its probe request frame 560(I) inquiry signals are answered by a member of the ad hoc network 102(I) detecting the inquiry." Olson at ¶ [0211]. *See also id.* at ¶ [0217] ("Active inquiry allows an IEEE 802.11 mobile station to find an ad hoc network while minimizing the time spent inquiring. The station does this by actively transmitting queries that invoke responses from stations in an ad hoc network. In an active inquiry, the mobile station 100(I) will move to a channel and transmit a probe request frame 560(I). If there is an ad hoc network 102(I) on the channel that matches the service set identity (SSID) in the probe request frame 560(I), the responding station in that ad hoc network will respond by sending a probe response frame 570(I) to the inquiring station 100.").

In addition, Kneckt, for example, discloses "[t]he client stations 106, 108, 110, 112, 114, 116 may receive more detailed information about the wireless networking or communication capabilities of one or more other client stations 106, 108, 110, 112, 114, 116 by sending a capability request message 208 to the broker station 104 via the air interface, to which the broker station 104 may respond by sending a network capability message, such as a capability response message to the respective client station 106, 108, 110, 112, 114, 116." Kneckt at ¶ [0038]. *See also id.* at ¶ [0040] ("The requested client station 108 may respond to the capability activation request by sending a capability activation response to the requesting client station 106 either directly via the air interface, or may route the capability activation request to the requesting client station 106 through the broker station 104. The capability activation response message may indicate or select one or more of the wireless communication or networking protocols indicated by the capability activation response message.").

Further, Seok, for example, discloses "a scanning procedure for a station receiving a probe request frame, the scanning procedure comprising allowing the station to respond with a probe response frame, only if: a Service Set Identifier (SSID) element in the probe request frame indicates a wildcard SSID or the SSID of the station." Seok at ¶ [0021]. *See also id.* at ¶ [0021] ("Referring to FIG. 2 again, one or more APs 4 having received the probe request frame transmits a probe response frame in response to the probe request frame (S20). The probe response frame is transmitted to the non-AP STA 2.").

Furthermore, Kim discloses, for example, "the first access point 21 counts the number of frames that it transmitted or received for a period of time F in order to measure the amount of data that the first access point 21 transmitted or received in the period of time F (72). The period of time F must be less than the difference between the amount of time required to receive the probe request frame and the amount of time required to transmit a response frame to the probe request frame." Kim at ¶ [0053]. *See also id.* at ¶¶ [0054]-[0057].

DOCSIS 2.0, furthermore, discloses that the cable modem, for example, "[t]ransmit[s] a continuous (non-bursted) upstream signal at the commanded modulation rate, carrier frequency, and power level. The chip sequence at the spreader output is replaced with an alternating binary sequence (1, -1, 1, -1, 1, -1,...) at nominal amplitude, equal on I and Q. The CM tracks the downstream symbol clock and uses it to generate the upstream symbol clock as in normal synchronous operation." DOCSIS 2.0 at 185. Furthermore, the cable modem "[t]ransmit[s] a continuous (non-bursted), unmodulated (CW) upstream signal at the commanded carrier frequency, modulation rate and power level. This is equivalent to replacing the chip sequence at the spreader output with the constant sequence (1, 1, 1, 1, 1, 1,...) at nominal amplitude, equal on

51

both I and Q. The CM tracks the downstream symbol clock and uses it to generate the upstream

symbol clock as in normal synchronous operation." *Id.*

Therefore, it would have been obvious to a person of ordinary skill in the art to combine

one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so

with a reasonable expectation of success.

  e) **"wherein the probe request requests a probe that assists in diagnosing a network problem" (Claim 7); and "wherein the probe request is configured to diagnose a network problem" (Claim 15)**

To the extent that it is determined that any of the above references do not disclose either

"wherein the probe request requests a probe that assists in diagnosing a network problem" or

"wherein the probe request is configured to diagnose a network problem," as claimed, it would

have been obvious to modify the teachings of that reference to include this feature at least in view

of the following exemplary teachings.

For example, Sadja teaches "[w]hile considering the functionality of the digital set top box,

it is noted that the STB contains functionality that can be used to effectively operate as an

extremely powerful diagnostic tool situated at each installation. Each STB contains a powerful

computer, a digital television receiver and a high speed modem that together can function to

provide on-demand subscriber information, network information and diagnostics that places a

great deal of power at the fingertips of the network operator." Sadja at 3:33-43. *See also id.* at

8:46-51 ("SNMP is the prevailing choice for remote diagnostics due to its explicit design as a

standardized method of 'Network Management'. Any SNMP enabled device found in the headend

will respond to SNMP requests, including all network infrastructures (CMTS, routers, etc) and

most servers (Linux & Windows based)."); *id*. at 8:52-58 ("Another common remote query method

used by equipment manufactures is by performing an HTTP GET request and parsing the response data. The data is returned in either in XML or HTML format, which can easily be parsed and the appropriate data extracted, or the data is returned in HTML, as a diagnostics web page from which the appropriate data can also be parsed and extracted."); *id*. at 11:61-12:11 ("A cable television diagnostic method for a cable television network consistent with certain embodiments involves sending a polling message to a plurality of modems forming a part of a plurality of television set top boxes from a cable television headend via a cable television cable connection to the set top boxes; wherein the polling message instructs the cable television set top boxes to obtain at least one operational parameter of each of the television set top boxes; receiving a plurality of response messages from the cable television set top boxes, each containing the at least one operational parameter of the television set top boxes; determining that one of the operational parameters from one of the television set top boxes is outside of a specified range of values; and aggregating the operational parameters of the plurality of set top boxes received in the response messages to determine if the same operational parameter is outside the range of specified values for more than the one of the television set top boxes.").

Furthermore, Olson teaches, for example, at ¶ [0086], "[o]ne embodiment of the rogue detection method uses information about beacons and probe responses received by APs and/or client stations that are managed by the WLAN manager 107. The method will be described by way of example using FIG. 6 that shows the tasks and messaging performed by the WLAN Manager 103, the Subnet Context Manager 105, the AP 107 in the subnet of Subnet Context Manager 105, and a client 115 of the AP 107."

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> f)   **"wherein the probe request is generated by a network operator and uploaded to the second/first node" (Claims 8 and 16)**

To the extent that it is determined that any of the above references do not disclose "wherein the probe request is generated by a network operator and uploaded to the second [or first] node," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

In one example, Sadja teaches "two-way capable STBs containing DOCSIS modems can provide more than just video and program guide services to the customer. The STB can keep the operator apprised of every aspect of the STB in the customer's house, ranging from the current video PID to the CA security device ID. This enhanced use of two-way communications allows the cable operators to monitor their plant, with a seamless logical extension of the plant past the tap to the actual devices in the subscriber's home. Thus, for the first time operators are provided the opportunity to monitor the network and its endpoints, not just the infrastructure." Sadja at 6:38-47. *See also id.* at 9:8-23 ("Effective monitoring begins in the headend, ensuring the core systems of the cable operator are functioning as expected and providing early detection of problems. Certain embodiments consistent with the present invention use various communication paths to aggregate headend systems status. All SNMP (Simple Network Management Protocol) and HTTP (Hyper-Text Transfer Protocol) enabled devices can be polled on scheduled intervals for status updates. Information about video/data delivery, device statuses and real-time log files can be stored on a centralized monitoring server thru the use of databases and the Linux syslog service. By monitoring and analyzing the incoming data, based on MSO defined criteria, the system can automatically take scripted response actions and/or alert appropriate personal pagers,

text messaging, email or other means. This allows efficient problem notification and resolution, minimizes downtime, and reduces maintenance costs.").

Olson, furthermore, discloses, for example, a "method includes receiving a scan request at the AP to scan for beacons and probe responses, the request received from a WLAN manager managing a set of managed APs and client stations of the managed APs." Olson at ¶ [0021]. *See also id.* at ¶ [0022] ("For each beacon or probe response on which information is received at the WLAN manager, the WLAN manager may analyze the information received in the report about the potential rogue AP that sent the beacon or probe response.").

DOCSIS 2.0, moreover, discloses "[t]he Test Request is used to force a CM to enter or leave one of two test modes. The TST-REQ message with Mode!= 0 MUST NOT be sent by the CMTS except in response to an explicit command from the operator." DOCSIS 2.0 at 184.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **g)** **"first plurality of probe parameters comprising a form for the probe including a modulation profile for the probe" (Claim 9)**

To the extent that it is determined that any of the above references do not disclose a "first plurality of probe parameters comprising a form for the probe including a modulation profile for the probe," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Sadja, for example, teaches "most manufacturers do not create their own remote data query system and protocols. Instead, they use one of two major open-standard systems. The two most frequently used methods for gathering data are currently the open-standard SNMP (Simple

Network Management Protocol) and the open-standard HTTP (Hyper Text Transfer Protocol) using XML (eXstensible Markup Language) or HTML (HyperText Markup Language) each of which are open-standards." 8:32-39. *See also id*. at 8:40-44 ("The DOCSIS specification requires, and CableLabs ensures, that every DOCSIS cable modem is equipped with a simple SNMP agent and responds to a standard set of requests. This provides a uniform interface to the cable modem, regardless of manufacturer."); *id*. at 12:59-13:33 ("The table below shows some exemplary values (variables) that can be retrieved during a polling operation consistent with certain embodiments of the present invention. Those skilled in the art will appreciate that these values may be readily available for retrieval by the set top box in many conventional designs, or could be designed into others with minimal modification. More extensive data can also be made available without departing from embodiments consistent with the present inventions.. . . QAM Channel Status[,] QAM Config Data[,] QAM SNR/CNR (Signal To Noise Ratio, Carrier To Noise Ratio)[,] QAM MER (Modulation Error Ratio).").

Olkkonen, moreover, discloses, for example, "[e]xamples of the metric used to rank the ad hoc networks by the received signal quality include Bit Error Rate accumulated over time, Packet Error Rate accumulated over time, received signal strength, link quality measurements, continuous-wave interference, co-channel interference, clear channel assessment (collision avoidance), collisions per unit time, retry counts, and frames canceled per unit time." Olkkonen at ¶ [0028]. *See also id*. at ¶ [0109] ("The arriving device 100 then compiles the network discovery menu in the arriving device, that ranks the ad hoc networks within its range by the received signal strength or other metric of the received signal quality."); *id*. at ¶ [0162] ("The quality of the signal characteristics can be measured by the received signal strength, the bit error rate, or other quality

56

of service (QoS) metrics. Then step 430 ranks the ad hoc networks by the quality of service (QoS) metrics.").

DOCSIS 2.0, moreover, discloses "[t]he TST-REQ message MUST be generated in the format shown in Figure 8-45, including all of the parameters coded as TLV multiples defined in Table 8-22." *See also id.* at 185-86:

Table 8-22   Channel TLV Parameters

Name	Type (1 byte)	Length (1 byte)	Value (variable length)
Modulation Rate	1	1	Multiples of base rate of 160 kHzc. (Value is 1, 2, 4, 8, 16, or 32.). This TLV MUST be present if the test mode is 1.

Table 8-22   Channel TLV Parameters (Continued)

Frequency	2	4	Upstream carrier frequency (Hz). This TLV MUST be present if the test mode is 1 or 2.
Power	3	1	This TLV specifies the power (unsigned 8-bit, dBmV units) at which the CM MUST transmit the TST-REQ message. This TLV MUST be present if the test mode is 1 or 2.
S-CDMA US ratio numerator 'M'	4	2	The numerator (M) of the M/N ratio relating the downstream symbol clock to the upstream modulation clock. This TLV MUST be present if the test mode is 1. This TLV MUST be present if the test mode is 2 and the operation is synchronous.
S-CDMA US ratio denominator 'N'	5	2	The denominator (N) of the M/N ratio relating the downstream symbol clock to the upstream modulation clock. This TLV MUST be present if the test mode is 1. This TLV MUST be present if the test mode is 2 and the operation is synchronous.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

h)   "wherein the first probe and second probe are transmitted simultaneously using OFDMA" (Claim 11)

To the extent that it is determined that any of the above references do not disclose "wherein the first probe and second probe are transmitted simultaneously using OFDMA," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Olson, for example, teaches, at ¶ [0084], "[a] frame we call the Measurement Report Frame from the client provides a report in response to a Measurement Request Frame. The Report frame includes the MAC address of the station providing the report, the identifier from the corresponding Measurement Request Frame, and one or more measurement elements. The measurement elements for the case of a beacon or probe response include one or more of the channel number, the duration over which the beacon/probe response was measured, the PHY type (DSS, 5 GHz OFDM, and so forth), the RSSI of the beacon/probe response, the parent TSF, e.g., all or some of the lower order bits of the serving AP's TSF at the time the client received the beacon or probe response, the TSF in the beacon/probe response, and one or more other elements that are in the received beacon/probe response frame."

Seok, for example, discloses "[i]n recent years, with the development of the wireless communication technology, 54 Mbps in maximum can be supported by applying the orthogonal frequency division multiplex (OFDM) technology, etc. to the WLAN. In addition, the IEEE 802.11 has developed or is developing wireless communication techniques for improvement in quality of service (QoS), compatibility of an access point (AP) protocol, security enhancement, radio measurement or radio resource measurement, wireless access in vehicular environment, fast roaming, mesh network, inter-working with external networks, wireless network management, and the like." Seok at ¶ [0008].

Similarly, Olkkonen discloses "[t]he IEEE 802.11 (a) Standard is designed for either the 2.4 GHz ISM band or the 5 GHz U-NII band, and uses orthogonal frequency division multiplexing (OFDM) to deliver up to 54 Mbps data rates." Olkkonen at ¶ [0013].

Furthermore, transmitting probes simultaneously using OFDMA would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B.   Invalidity of the '690 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '690 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '690 Patent are invalid for failure to provide a written description that enables the full scope of the asserted claims and demonstrates that the inventor had possession of the claimed invention based on at least the following claim terms, phrases, or limitations:

- "probe request" (claims 1, 7-9, 11, 15, and 16)

    - The specification and drawings of the '690 Patent do not define or describe the term "probe request" in such full, clear, and concise terms sufficient to demonstrate that the inventor was in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation.

- "a form dictated by the first plurality of parameters" (claim 1)

59

       ○   The specification and drawings of the '690 Patent do not describe parameters that dictate a form for a probe in such full, clear, and concise terms sufficient to demonstrate that the inventor was in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation.

- "wherein the probe request is generated by a network operator and uploaded to the second node" (claim 8)

       ○   The specification and drawings of the '690 Patent fail to disclose a network operator generating and uploading a probe request to a node.

- "physical layer probe" (claim 9)

       ○   The specification and drawings of the '690 Patent do not define or describe the term "physical layer probe," demonstrating that the inventor was not in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation.

- "probe parameters comprising a form for the probe" (claim 9)

       ○   The specification and drawings of the '690 Patent do not define or describe "probe parameters" that comprise a "form" for a probe, demonstrating that the inventor was not in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation.

- "wherein the probe request is generated by a network operator and uploaded to the first node" (claim 16)

       ○   *See supra* (claim 9).

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C.   **Invalidity of the '690 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)**

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of

the '690 Patent, to the extent such positions can be understood from Plaintiff's Supplemental

Infringement Contentions, Defendant asserts that the asserted claims of the '690 Patent are invalid

for reciting at least the following claim terms, phrases, or limitations:

- "wherein the first probe and second probe are transmitted simultaneously using OFDMA" (claim 11)

    o   The term "first probe" lacks antecedent basis, rendering the claim indefinite.

- "physical layer probe" (claim 9)

    o   This term is indefinite under 35 U.S.C. § 112, ¶ 2 unless it is construed as a "probe," as discussed in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "generating the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters" (claim 1)

    o   This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "wherein the probe is generated in accordance with the first plurality of parameters and in accordance with a second plurality of parameters determined by the second node" (claim 9)

    o   This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "the first plurality of probe parameters comprising a form for the probe including a modulation profile for the probe"(claim 9)

    o   This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate

the definiteness requirements of 35 U.S.C. § 112.

V.   THE '008 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits C1 through C11[8] and/or described below anticipate and/or render obvious, alone or in combination, one or more of the asserted claims of the '008 Patent.

1.   The '008 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '008 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits C1 through C11, which identify specific examples of where each limitation of the asserted claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references as anticipating one or more of the asserted claims of '008 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '008 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

---

[8] Exhibits C1-C10 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

a)   **Prior Art Patents and Applications**

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent No. 9,686,594	June 20, 2017	Gomez	C1
U.S. Patent No. 5,874,992	February 23, 1999	Caporizzo	C2
U.S. Patent App. Pub. No. 2007/0286311 A1	December 13, 2007	Coyne	C3
U.S. Patent App. Pub. No. 2009/0128708 A1	May 21, 2009	Huffman	C4
U.S. Patent No. 6,704,372	March 9, 2004	Zhang	C5
U.S. Patent No. 8,582,694	November 12, 2013	Velazquez	C6
U.S. Patent No. 8,424,049	April 16, 2013	Skelly	C7
U.S. Patent No. 5,808,671	September 15, 1998	Maycock	C8
U.S. Patent App. Pub. No. 2005/0114879 A1	May 26, 2005	Kamieniecki	C9
U.S. Patent No. 7,403,486	July 22, 2008	Flask	C10
U.S. Patent No. 7,528,888	May 5, 2009	Narita	C11

b)   **Prior Art Systems**

Defendant's further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional information about relevant prior art systems. Defendant reserves the right to further supplement these Invalidity Contentions based on subsequent investigation and discovery, including from third parties. In particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendant further reserves the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendant also incorporates by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

* * * * *

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '008 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '008 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '008 Patent are not explicitly disclosed by any prior art identified above and/or in Exhibits C1 through C11, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits C1 through C11 with each other, at least because all of these references relate to receiving and/or analyzing broadband or wideband signals over cable television and telecommunications networks. The references set forth above are therefore all in the same or similar fields of endeavor.

64

For example, U.S. Patent No. 9,686,594 ("Gomez") teaches "[a] system, method, and apparatus to allow an operator of a broadcast communication system, such as a cable television or satellite television service to provide some examples, to diagnose performance of this communication system remotely. The operator of a first communication device, such as a cable modem termination system (CMTS) to provide an example, may remotely diagnosis performance problems, or potential performance problems, occurring at a second communication device, such as a cable modem (CM) to provide an example, or a group of second communication devices." Gomez at Absract.

Further, U.S. Patent No. 5,874,992 ("Caporizzo") teaches "a settop terminal which analyses each data packet received by the settop terminal and determines whether the received data packet includes errors. The bit error rate is continually calculated, monitored and stored. When the bit error rate exceeds a predetermined threshold, the settop terminal generates a warning signal for transmission to the headend, which diagnoses the problem. In this case the cable system can utilize the results from a group of households that have the same problem in order to isolate the source of failure." Caporizzo at 1:64-2:6.

Furthermore, U.S. Patent Application Publication No. 2007/0286311 A1 ("Coyne") teaches "a channelized receiver" having extended capabilities to enable a communications system "to perform electronic surveillance monitoring (ESM)", "receive, process and provide information to downstream devices," provide "wideband communications capability," and which includes "a programmable demodulator for extracting communications data from incoming signals." Coyne at Abstract.

Additionally, U.S. Patent Application Publication No. 2009/0128708 A1 ("Huffman") discloses a "multimedia signal monitoring unit" that includes "a multimedia signal receiver for

receiving an encoded multimedia stream, and a plurality of decoders." Huffman at Abstract. Further, the "monitoring unit includes an analysis module employing multiple algorithms for demodulating and analyzing a digital multimedia signal." *Id*. at ¶ [0012].

Furthermore, U.S. Patent No. 6,704,372 ("Zhang") teaches "a digital multi-channel demodulator circuit. The demodulator includes a frequency-block down-converter that receives a multi-channel analog RF signal and shifts the multi-channel analog RF signal to a lower frequency band. An ADC receives the multi-channel analog RF signal from the frequency-block down-converter and converts the multi-channel analog RF signal to a multi-channel digital RF signal. A digital channel demultiplexer receives the multi-channel digital RF signal from the ADC and demultiplexes the multi-channel digital RF signal into separate digital RF channels." Zhang at Abstract.

U.S. Patent No. 8,582,694 ("Velazquez") discloses "a dynamic channelizer that is adaptively tuned based on detected signals, . . . a powerful software reconfigurable digitizer that is adaptively optimized for the current signal environment to control important receiver parameters such as bandwidth, dynamic range, resolution, and sensitivity." Velazquez at This approach adaptively adjusts the signal processing to provide optimal performance for the current signal environment. The adaptive adjustment uses heuristic and iterative approaches for identification of signals of interest and jammer/interference signals for tuning the digital channelizer and for selecting appropriate high-performance digital signal processing techniques to trade off bandwidth, dynamic range, resolution, and sensitivity." Velazquez at 1:46-58.

Furthermore, U.S. Patent No. 8,424,049 ("Skelly") teaches "[a] video signal is provided to a set top box. An instruction to record a specified portion of the video signal, thereby creating a video sample, is provided to the set top box. The video sample is received from the set top box.

Reference video corresponding to the video sample is obtained. A comparison of the video sample and the reference video is performed." Skelly at Abstract.

Furthermore, U.S. Patent No. 5,808,671 ("Maycock") teaches an "[a]pparatus for and a method of monitoring the transmission of an analog video signal through a video signal transmission channel, e.g. a fiber optic cable from a headend capturing the analog video signal at a location remote from the headend and select a signal channel from the captured video signal. The selected signal channel is digitized and serialized as a digital signal and the digital signal is transmitted as an optical signal through an optical fiber cable to a monitoring location, where the digital signal is converted to an analog video signal which is displayed on a video monitor." Maycock at Abstract.

In addition, U.S. Patent Application Publication No. 2005/0114879 A1 ("Kamieniecki") teaches that "[i]nformation related to signal quality on the downstream and upstream paths [] in a cable network may be monitored [] at selected ones of a plurality of set-top boxes [] and sent by the set-top box to the headend [] as it is collected, or when the set-top box is polled by the headend." Kamieniecki at Abstract.

Furthermore, U.S. Patent No. 7,403,486 ("Flask") teaches "[a]n apparatus that includes a coupling, a signal level measurement circuit, a communication circuit and a processing circuit. The coupling is configured to connect to and received broadband RF signals from a coaxial cable termination of a communication network. The signal level measurement circuit is operably coupled to the coupling, and is operable to generate signal level measurements regarding a first set of the broadband RF signals." Flask at Abstract.

In addition, U.S. Patent No. 7,528,888 ("Narita") teaches "a TV broadcast receiver that enables a user to easily make a judgment on the condition of reception of a TV signal. According

to an aspect of the present invention, a television broadcast receiver comprises: a tuner that receives a television signal; signal strength detecting means for detecting a strength of the television signal received by the tuner; desired to undesired (D/U) ratio determining means for determining a D/U ratio of the television signal received by the tuner to detect multipath effects; carrier to noise (C/N) ratio determining means for determining a C/N ratio of the television signal received by the tuner to detect interference impairment; received signal quality informing means for presenting information on a quality of the television signal received by the tuner to a user; receiving condition evaluation table storage means for storing a receiving condition evaluation table used for overall evaluation of a condition of the reception of the television signal received by the tuner, the receiving condition evaluation table containing an overall evaluation value, indicating a condition of reception of a television signal, for each combination of a signal strength, a D/U ratio, and a C/N ratio; and overall evaluation value determining means for reading the receiving condition evaluation table to determine an overall evaluation value for the television signal received by the tuner based on the signal strength detected by the signal strength detecting means, the D/U ratio determined by the D/U ratio determining means, and the C/N ratio determined by the C/N ratio determining means, wherein the received signal quality informing means presents the overall evaluation value determined by the overall evaluation value determining means to the user." Narita at 1:31-61.

Accordingly, because the identified references are directed to similar devices and techniques in similar fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the teachings of two or more references with a reasonable expectation of success.

68

> a) "an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Gomez teaches "the receiver 402 may be characterized as being a wide-band and/or full band capture receiver. In this example, the receiver 402 can include a wide-band capture analog digital converter (ADC) that is capable of converting multiple channels and/or services within the received communication signal 452 from a representation in the analog domain to a representation in the digital domain." 11:32-39.

Coyne, moreover, teaches, for example, "[c]ombiner 220 combines these signals to a wideband or ultra-wideband spectral space, and provides output to analog-to-digital converter (ADC) 230. ADC 230 provides a digital representation of the combined signal to channelizer 240, which de-multiplexes that digital signal into one or more channel outputs 245." Coyne at ¶ [0022].

Velazquez discloses, for example, "FIG. 3 illustrates the software reconfigurable digitizer 210 according to an embodiment of the invention. Here, the software reconfigurable digitizer 210 comprises an array of analog-to-digital converters (ADC) 310A-D and reconfigurable DSP algorithms 320 responsive to the adaptive real-time control algorithm 230. The use of four ADCs 310A-D as shown is exemplary only—the use of four ADCs 310A-D increases the bandwidth of the conversion by four times while maintaining very high resolution." Velazquez at 7:38-46.

69

Furthermore, Skelly teaches, for example, "Video distribution network 110 may include one or more components for known types of video networks, such as digital, optical, or analog networks. Further, video signal 101 may be converted from analog to digital or vice-versa within video distribution network 110. Video distribution network 110 provides signal 101 to set top box (STB) 115. STB 115 is usually, although not necessarily, located at a customer premises such as a residence, hotel, office, etc. subscribing to video services provided via network 110." Skelly at 2:33-37.

Additionally, Maycock discloses, for example, "[a] demodulator 34 has two output paths. A first path extends to an audio demodulator 36 and the other extends to an analog-to-digital converter 38. The resolution of the analog-to-digital converter 38 is chosen carefully so as not to degrade the performance of the received signal. In the present embodiment of the invention, the analog-to-digital converter 38 provides 8 bit resolution giving a theoretical signal-to-noise ratio of approximately 60 dB." Maycock at 4:25-34.

Flask, furthermore, discloses, for example, "[an] ADC 364 is operable to generate digital samples of the filtered and gain adjusted IF signal and provide those samples to the DSP 366. Such ADCs are known." Flask at 13:25-28.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **b)** **"a signal monitor operable to: analyze said digitized signal to determine a characteristic of said digitized signal" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "a signal monitor operable to: analyze said digitized signal to determine a characteristic of said digitized

signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Gomez teaches "[t]he one or more plant diagnostic tools measure various signal parameters of various signals within the communication system 100 and provide these signal parameters to the service provider location 102. The signal parameters may include one or more of spectral density, received signal strength, relative strength of different channels and services, noise floor and interference, transmitter frequency offsets, and/or any other suitable signal parameter that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the present disclosure." Gomez at 4:61-5:3.

Caporizzo, moreover, teaches, for example, "a settop terminal which analyses each data packet received by the settop terminal and determines whether the received data packet includes errors. The bit error rate is continually calculated, monitored and stored." Caporizzo at 1:64-2:1. *See also id.* at 5:50-61 ("the settop terminal 10 detects and determines the BER on the channel currently viewed by the subscriber. The BER may be calculated for any time duration. (e.g. five minutes, ten minutes or one hour) or continuously, and stored in memory 160. The central processor 71 may also instruct the settop terminal 10 to determine the BER on selected CATV channels whenever the subscriber terminal is not turned ON. Accordingly, the BER of every channel may be monitored by the CATV network operator daily, hourly or even more frequently. As a result, BER data may be collected for every channel and at every time during the day.").

Furthermore, Coyne discloses, for example, "programmable demodulator 250 may be capable of processing channel output generated by channelizer 240 to suit any number of applications. In one example, programmable demodulator 250 may execute one or more programmed procedures to compensate for Doppler frequency shift, which can occur when a signal

71

is received on a mobile platform from a transmitter which is moving with respect to the mobile platform. For example, a signal received by a first airplane from a second airplane that is moving toward the first airplane at a supersonic speed may shift, for example, up to 4 MHz, and can cause a receiver on the first airplane tuned to a specific channel to lose the signal. Accordingly, in some embodiments, programmable demodulator 250 may process channel output of channelizer 240 to detect and/or compensate for Doppler frequency shift." Coyne at ¶ [0036]. *See also id.* at ¶ [0044] ("System 400 also includes a switch which allows a connection to be made to either of terminals 420A or 420B. When a connection is made to terminal 420A, channelizer 240 provides channel output to signal detection decision logic 430. For example, channel output may be provided to threshold mask generation module 120 and decision logic 140 (described above with reference to FIG. 1). When a connection is made to terminal 420B, channel output is provided to demodulation processing logic 440. For example, channel output may be provided to programmable demodulator 250 (FIG. 2), which may extract communications data therefrom (e.g., for delivery to interface module 260).").

In addition, Huffman discloses, for example, "[m]onitoring unit 106 may monitor the transmission subsystem and the reception subsystem for a multimedia signal, since error can occur at either location. Monitoring unit 106 may monitor and diagnose errors resulting from the signal transmission or receiver equipment as well as errors resulting from geographical or environmental disturbances, including weather related disturbances." Huffman at ¶ [0024].

Furthermore, Flask teaches, for example, "The measurement circuit 304 is a circuit that performs or at least plays a significant role in the measurement operations of the device 300. In the embodiment of FIG. 3, the measurement circuit 304 performs analog television signal level measurement, digital signal level measurement, MER, BER measurements, Docsis measurements

72

and cooperates with the control processor 370 of the control/interface circuit 306 to perform throughput and packet loss measurements. It will be appreciated that the measurement circuit 304 (alone or in combination with other circuits) may be configured to perform a different set of tests that includes at least some of the above mentioned tests, as well as others." Flask at 9:22-33.

Narita also teaches a "TV broadcast receiver 1 [that] comprises a tuner 11, a front end 12 for subjecting a TV signal received by the tuner 11 to predetermined signal processing to decode the TV signal, an MPEG decoder 13 for decoding an MPEG-compressed TV signal, an on-screen display (OSD) unit 14 for Superimposing predetermined image data on a decoded TV signal, a memory 15 for storing various kinds of information, and a controller 16 for controlling each component in the TV broadcast receiver 1." Narita at 3:40-4:8.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

<div align="center">

c)   **"a signal monitor operable to: report said determined characteristic to a source of said received signal" (Claim 1)**

</div>

To the extent that it is determined that any of the above references do not disclose "a signal monitor operable to: report said determined characteristic to a source of said received signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, discloses "[t]he parameter measurement module 406 may additionally provide the one or more signal parameters, or the indications of the one or more signal parameters, as one or more signal parameters 464 which are in turn provided to the service provider

<div align="center">73</div>

by the transmitter 408 to remotely diagnose performance problems, or potential performance problems, within the communication system in real time." Gomez at 12:58-64.

Similarly, Caporizzo discloses, for example, "the settop terminal 10 may initiate a procedure for determining the BER of upstream communications sent from the settop terminal 10 to the headend 15. In this embodiment, the settop terminal 10 generates a message and transmits this message to the headend 15. In the same manner as described for the preferred embodiment, the central processor 71 within headend 15 includes means 70 for receiving the message, detecting errors, calculating the BER and forwarding the BER back to the settop terminal 10." Caporizzo at 6:45-54.

Furthermore, Huffman discloses, for example, at ¶ [0029], "Monitoring unit 106 may also connect, wirelessly or otherwise, to a local or remote monitoring station via a communications link so as to enable monitoring unit 106 to upload data related to multimedia signal 103 to the monitoring station. If the monitoring station is notified of an error in multimedia signal 103 by monitoring unit 106, technicians are able to begin diagnosing and correcting the same."

In addition, Kamieniecki discloses, for example, "The invention therefore provides a method to allow a set-top box (STB) to collect statistics on plant health by monitoring the forward (downstream) and reverse (upstream, return path) transport cable signals, and reporting this information back to the cable headend. Kamieniecki at ¶ [0016]. *See also id.* at ¶ [0017] ("The monitoring feature can operate automatically in the background so as not to disturb any viewer experiences; i.e., when the STB is turned 'off' and in an idle state. The STB will collect statistics on plant health, as indicated by signal quality, on a channel-by-channel basis. It is within the scope of the invention that fewer than all of the channels are monitored. (The channel map can indicate which channels will be monitored.) These statistics can either be stored for future collection by the

74

headend 102 via a two way polling mechanism, or the STB 110 can actively transmit (report, forward) the statistics back to the head-end as they are collected. Two-way polling can be implemented, for example, by polling the STB from the headend via the downstream path (typically on the OOB channel), and having the STB report back via the upstream path."

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

      d)   **"a data processor operable to process a television channel to recover content carried on the television channel" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "a data processor operable to process a television channel to recover content carried on the television channel," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, discloses "[t]he baseband processor 404 may process the received sequence of data 454 to provide a recovered sequence of data 456 for one or more devices of the communication system." Gomez at 11:45-48. *See also id.* at 14:33-36.

Caporizzo, moreover, teaches, for example, "[t]he settop terminal 10 receives an input signal from the CATV dropline 60. The tuner 130 tunes to the channel desired by the subscriber and removes the carrier frequency. A demodulator 132 and a VBI data receiver 134 extract the VBI data from the analog audio and video (A/V) signals. The analog A/V signals are then forwarded by the microprocessor 138 to the modulator 144 which places the A/V signals on a selected RF carrier frequency, typically television channel 3 or 4, for input to the television set 20." Caporizzo at 4:5-14.

Furthermore, Huffman discloses, for example, "[a] multimedia signal 103 is sent from transmitter 107 to regional office 102 of a content provider or service provider. Regional office 102 sends multimedia signal 103 to receivers 104, e.g. televisions, to be demodulated by the receiver units and converted to signals capable of being viewed by a user on display device 105." Huffman at ¶ [0029]. *See also id.* at ¶ [0017] ("regional office 102 transmits multimedia signal 103 to one or more multimedia signal receivers 104. To the extent that multimedia signal 103 is compressed, encrypted, and/or otherwise encoded, multimedia signal receivers 104 are operable to decode multimedia signal 103 and display the decoded signal on a display device 105. Multimedia signal receiver 104 and display device 105 may be implemented as a set top box connected to a television set or a set top box connected to a display monitor.").

Zhang, moreover, discloses, for example, as background, "[t]he function of each tuner 110 is to select an RF channel falling within a specific frequency band. There is one tuner for each RF channel. The input RF signal for a tuner contains many or all RF channels. Each tuner then converts the frequency of its selected RF channel to a lower fixed frequency pass band for cable systems, or to baseband for satellite systems. Each ADC 120 then digitizes the selected RF signal. Then each digital demodulator 130 performs signal demodulation and outputs recovered digital bits with error indication signals." Zhang at 1:50-61. *See also id.* at 4:18-25 ("Many functional blocks can be shared between different demodulators. Such functional blocks, for example, can include numeric controlled oscillators (NCOs), timing error detection circuitry, carrier recover circuitry, etc. Because of the resource sharing between such demodulators, significant power saving is achieved. Hence, with such embodiments of the present invention, more RF channels can be demodulated in a single chip.").

Furthermore, Maycock teaches, for example, an "apparatus for monitoring the transmission of a video signal from a headend employs means at a location remote from the headend for capturing the video signal. The captured video signal is passed to a channel selector, which selects a signal channel from the captured video signal. The selected channel is then demodulated, digitized and serialized in a digitizer and transmitted as a digital video signal to a monitoring location, where it is converted back into an analog video signal for display on a monitor and test equipment." Maycock at 2:20-29.

Flask, moreover, teaches "the baseband audio-visual baseband information for each broadcast channel is modulated onto a particular channel frequency carrier and then combined with all of the other channel frequency carriers to form a multichannel broadband RF signal. The broadband RF signal provided to the headend optical encoder/decoder 124. The headend optical encoder/decoder 124 converts the broadband RF signal to an optical signal, which then propagates through the fiber plant 114 to the nodes 126. The nodes 126 convert the optical signal back to a broadband RF signal and then provide the broadband RF signal to the lines of the cable plant 116. The cable plant 116, the network tap lines 118 and the subscriber drop lines 120 cooperate to provide the broadband RF signal to each subscriber premise 122. If the subscriber premise 122 has a television 128 operably connected to the drop line 120, then the television 128 may tune and display any of a plurality of audiovisual programs within the broadband RF signal." Flask at 5:55-6:4.

Narita further disclose that "[t]he tuner 11 receives TV signals via the Yagi antenna Y and selects a signal on a desired channel from among the received TV signals. The front end 12 (signal strength detecting means, desired to undesired (D/U) ratio determining means, and carrier to noise (C/N) ratio determining means) includes an analog to digital (A/D) converter, a waveform

equalization circuit, a C/N determining circuit, and an error correcting circuit. The front end 12 determines the signal strength, the D/U ratio, and the C/N ratio of a TV signal for output to the controller 16. Further, the front end 12 performs an error correction and separates required transport stream (TS) packets from multiplexed signals to Supply the required TS pack ets to the respective blocks in the TV broadcast receiver 1. The MPEG decoder 13 decodes video stream separated by the front end 12 and outputs the decoded video signal via the OSD unit 14 to the monitor 3. Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success." Narita 3:40-4:8.

> e)   "a channelizer operable to: select a first/second portion of said digitized signal" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "a channelizer operable to: select a first [and] second portion of said digitized signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Coyne, for example, discloses, at ¶ [0005], "[i]n channelized receiver 100, input energy is provided to channelizer 110, which includes multiple filters 110 1, 110 2 . . . 110 n. Each filter in filter bank 110 has a different center frequency, with the filters being ordered in accordance with their center frequencies. The output of each filter represents the components of the input having frequencies falling in the pass band of that filter. The outputs of channelizer 110 are applied to a bank of comparators 130 1, 130 2 . . . 130 n." *See also id.* at ¶ [0022] ("Combiner 220 combines these signals to a wideband or ultra-wideband spectral space, and provides output to analog-to-digital converter (ADC) 230. ADC 230 provides a digital representation of the combined signal to

channelizer 240, which de-multiplexes that digital signal into one or more channel outputs 245."); *id*. at ¶ [0030] ("In some embodiments, channelizer 240 de-multiplexes the output of ADC 230 to separate it into different communication sets, such as voice data, video, data streams, other information, or a combination thereof.").

Furthermore, Zhang teaches, for example, "[a] digital channel demultiplexer 230 then demultiplexes the multi-channel digital RF signal into separate digital RF channels C1 to Cn. The specific implementation of channel demultiplexer 230 will depend on the specific application and requirements. Alternative channel demultiplexer embodiments are described in more detail below (FIGS. 2 and 3). Still referring to FIG. 2, an n×m digital selector 240 receives the demultiplexed digital RF channels C1 to Cn and then selects one or more of the RF channels D1 to Dm from one or more of the digital RF channels C1 to Cn. RF channels C1 to Cn contain content channels that are selected or used by a subscriber." Zhang at 3:60-4:4. *See also id.* at 4:33-43 ("FIG. 3 is a simplified high-level schematic diagram of a digital tuner 300, which in some embodiments of the present invention, can be used to implement digital channel demultiplexer 230 of FIG. 2. Digital tuner 300 includes a bank of n numeric control oscillators (NCOs) 310(1 . . . n), complex multipliers 320(1 . . . n), and low-pass filters (LPFs) 330(1 . . . n). One chain of each of these elements is used for each RF channel. The exact number of these elements will depend on the number of RF channels to be demultiplexed. In this specific embodiment, low-pass filters 330 are high-speed finite impulse response (FIR) filters.").

Further, Velazquez discloses, for example, "[f]or example, the user may desire to track the 10 largest amplitude signals. The adaptive real-time control algorithm 230 catalogs the 10 largest amplitude signals detected by the signal detection algorithm 240, provides input to the dynamic channelizer 220 on the location and bandwidth of those signals so they can be extracted, and

provides input to the digitizer 210 to activate one or more DSP techniques to enhance the detected signals." Velazquez at 6:58-65.

Kamieniecki discloses, for example, that a "set-top box 110 has more than one tuner (112, 114) so that it can receive out-of-band (OOB) communications simultaneously with in-band (IB) communications. This means that subscribers can be tuned to a channel receiving audio and video content while, at the same time, the STB 110 is receiving instructions in an OOB channel. The communications from the headend 102 to the STB 110 comprises the OOB channel(s) and a plurality of IB channels." Kamieniecki at ¶ [0013]; FIG. 1.

Flask, moreover, discloses, for example, "the test equipment included an RF signal receiver and circuitry for measuring signals received on select channels of the system. Measurement a large number of channels provides a rough spectrum analysis of the cable network. Various test devices that measured analog cable television channels were developed." Flask at 1:55-60 (Background of the Invention). *See also id.* at 17:52-61 ("Another operation of the device 300 is digital channel SLM. In particular, one measure of HFC system operation is the signal level of digital television signals, or even digital data signals such as those that carry Internet data packets. As with new or existing analog service, it is useful to perform digital channel SLM for digital cable service. For new service, the measurements ensure the quality of the physical plant signal path to each customer. For existing service, the measurements may be used to troubleshoot problems on a particular channel or set of channels.").

Narita also teaches that "[a]s shown in FIG. 1, the TV broadcast receiver 1 is an apparatus that is connected to a Yagi antenna Y or the like to receive a digital TV signal (hereinafter, referred to simply as "TV signal) transmitted in a given frequency band from a broadcast station and output a TV program contained in TV signals on each channel to a monitor 3. It is to be noted that a

physical channel, which is a frequency band of carrier wave used for broadcasting a TV program, is herein referred to simply as "channel." The TV broadcast receiver 1 comprises a tuner 11, a front end 12 for subjecting a TV signal received by the tuner 11 to predetermined signal processing to decode the TV signal, an MPEG decoder 13 for decoding an MPEG-compressed TV signal, an on-screen display (OSD) unit 14 for Superimposing predetermined image data on a decoded TV signal, a memory 15 for storing various kinds of information, and a controller 16 for controlling each component in the TV broadcast receiver 1." Narita at 3:40-4:8

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **f)** **"a channelizer operable to: concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "a channelizer operable to: concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

In one example, Coyne discloses, at ¶ [0044], "[s]ystem 400 includes combiner 220, ADC 230 and channelizer 240, described above with reference to FIG. 2. System 400 also includes a switch which allows a connection to be made to either of terminals 420A or 420B. When a connection is made to terminal 420A, channelizer 240 provides channel output to signal detection decision logic 430." *See also id*. at ¶ [0047] ("functionality provided by signal detection decision

81

logic 430 and demodulation processing logic 440 may be provided by a single component which,

for example, executes programmed procedures that perform either or both functions, and/or other

functions. In this respect, signal detection decision logic 430 and demodulation processing logic

440 should be viewed as functional (and not necessarily physical) components which may be

implemented in any suitable fashion."); *id*. at ¶ [0005] ("The outputs of comparators 130 1, 130 2

. . . 130 n are provided to decision logic 140, which processes the outputs to identify whether

certain of the channels contains a signal that should be selected for further processing."); id. at ¶

[0022] ("ADC 230 provides a digital representation of the combined signal to channelizer 240,

which de-multiplexes that digital signal into one or more channel outputs 245. Programmable

demodulator 250 processes the output(s) 245 to extract communications data, and provides one or

more outputs 255 to interface module 260. Interface module 260 provides output(s) 255 to one or

more downstream devices (e.g., onboard a military vehicle)."

Kamieniecki discloses, for example, "[t]here is a bi-directional flow of information

between the subscriber's set-top box 110 and the cable operator's headend 102. The set-top box

110 has more than one tuner (112, 114) so that it can receive out-of-band (OOB) communications

simultaneously with in-band (IB) communications. This means that subscribers can be tuned to a

channel receiving audio and video content while, at the same time, the STB 110 is receiving

instructions in an OOB channel."

Furthermore, Huffman discloses, for example, "[e]ach circuit board 405 contained within

the chassis 403 of monitoring unit 106 may directly tap into the multimedia signal output to the

receivers 104, or may in the alternative be connected to another control circuit that further directs

the signals incoming to and outgoing from monitoring unit 106." Huffman at ¶ [0030]. *See also*

id. at ¶ [0034] ("In use, monitoring unit 106 may be continuously monitoring outgoing television

signals for multiple channels of content using multiple chip sets with different processing capabilities, i.e., it is demodulating and processing the data packets for each output channel using chipsets corresponding to multiple generations of receivers. To do this, a particular circuit board 405 is either automatically selected or selected by a user as described above. The circuit board then outputs appropriate monitoring or diagnostic signals to the station and the next circuit board is queried. When a new chipset is delivered to market, the operator removes the top portion of the monitoring unit and either expands the number of boards, or replaces a board already contained therein. The monitoring unit is then reset, i.e., the maximum number of circuit boards, time to query each board, etc., and the monitoring unit resumes monitoring the digital signal. In this way, monitoring unit 106 is capable of changing and expanding to test digital signals according to the capabilities of different generations of chipsets.").

Additionally, Flask teaches, for example "receiver circuit 328 and the signal level measurement circuit 330 are both connected to the frequency conversion circuit 308 of the tuner circuit 302 through a splitter 350. The receiver circuit 328 includes a gain adjustment amplifier 352 and the modem circuit 332. The modem circuit 332 is operable to receive Internet protocol packets (VoIP or otherwise) and provide output to various devices on the control/interface circuit 306. In one mode (VoIP mode), the modem circuit receives VoIP protocol data packets and provides analog voice signals to the speaker phone chip 374 of the control/interface circuit 306. In another mode, the modem circuit receives IP data packets and provides the packets to the control processor 370 of the control/interface circuit 306. In still another mode, the modem circuit 332 provides BER, MER, packet loss, delay (latency) and jitter information to the control processor 370, as will be discussed further below. Thus the modem circuit 332 enables reception of VoIP packets, the reception of other non-VoIP Internet data packets, and the performance of various

83

measurements, including BER, MER, packet loss, delay and jitter measurements." Flask at 12:42:61.

Further, Narita discloses a "TV broadcast receiver 1 according to this embodiment reads the receiving condition evaluation tables 51 to 56 to determine an overall evaluation value 50 indicating the condition of reception of a TV signal based on the signal strength, the D/U ratio, and the C/N ratio of the TV signal that are determined at the front end 12, and presents the overall evaluation value 50 to a user. This allows the user to easily make a judgment on whether the condition of reception of the TV signal is good or not." Narita at 5:59-67.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

g)   **"wherein said first portion of said digitized signal spans said entire television spectrum" (Claim 2)**

To the extent that it is determined that any of the above references do not disclose "wherein said first portion of said digitized signal spans said entire television spectrum," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, discloses "[i]n some situations, the sounding source and/or the sounding receiver may be implemented as a full-band transmitter and a full-band capture receiver, respectively. In these situations, the full-band transmitter by provide the sounding signal that occupies multiple communication channels with are all received by the full-band capture receiver." Gomez at 6:6-12. *See also id.* at 11:32-39 ("For example, the receiver 402 may be characterized as being a wide-band and/or full band capture receiver. In this example, the receiver 402 can

include a wide-band capture analog digital converter (ADC) that is capable of converting multiple channels and/or services within the received communication signal 452 from a representation in the analog domain to a representation in the digital domain."); *id.* at 14:28-32.

Additionally, Zhang, for example, teaches "[a] multi-channel RF input signal typically includes a plurality of RF channels, each characterized by a different carrier frequency and being modulated in accordance with desired information to be carried on that channel. Each channel's bandwidth is less than the spacing of the carrier frequencies. For example, carrier frequencies in the UHF band (300 MHz to 3 GHz) may be spaced at 6 MHz intervals. Included are receiver chains 102 a, 102 b, and 102 c. Each chain includes a tuner 110, an analog-to-digital converter (ADC) 120 and a digital demodulator 130. Digital demodulator 130 includes a forward error correction (FEC) circuit (not explicitly shown)." Zhang at 1:35-49.

Moreover, Huffman discloses, for example, "if the multimedia signal 103 as received by monitoring unit 106 is a broadcast signal, monitoring unit 106 may demodulate and/or decode the multimedia signal so that the multimedia signal 103 as delivered to receiver 104-2 is demodulated and/or decoded. Although FIG. 1 depicts tap 108 as being located between regional office 102 and receiver(s) 104, the tap may also be located further 'upstream' such as where multimedia signal 103 is received by regional office 102." Huffman at ¶ [0020]. *See also* Flask at 18:52-65.

Narita further describes "a television (TV) broadcast receiver according to a first embodiment of the present invention is described. As shown in FIG. 1, the TV broadcast

receiver 1 is an apparatus that is connected to a Yagi antenna Y or the like to receive a digital TV signal (hereinafter, referred to simply as "TV signal) transmitted in a given

frequency band from a broadcast station and output a TV program contained in TV signals on each channel to a monitor 3. It is to be noted that a physical channel, which is a frequency band

of carrier wave used for broadcasting a TV program, is herein referred to simply as 'channel.'"

Narita at 3:40-67.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B. Invalidity of the '008 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '008 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '008 Patent are invalid for failure to provide a written description that enables the full scope of the asserted claims and demonstrates that the inventor had possession of the claimed invention based on at least the following claim terms, phrases, or limitations:

- "a channelizer operable to: . . . concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor" (claim 1)

  o The specification and drawings of the '008 Patent fail to disclose that the channelizer is operable to concurrently output a first portion of a signal to a signal monitor and a second portion of the signal to a data processor, demonstrating that the inventor was not in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation. *See, e.g.*, '008 Patent at 4:45-50 ("The data processing module 156 may process one or more of bands C_1-C_J to recover data on one or more channels (e.g., television and/or DOCSIS channels) present in those bands while the monitoring module 154 may *concurrently process* band C_{J+1} to measure/determine characteristics of all or a portion of the signal S between f_{lo} and f_{hi}.") (emphasis added); *id.* at 6:28-36 (describing the *sequential outputting* of bands to the data processor and signal monitor); *id.* at FIG. 4.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C.   Invalidity of the '008 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '008 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '008 Patent are invalid for reciting at least the following claim terms, phrases, or limitations:

- "signal monitor" (claim 1)

    o The term "signal monitor" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

- "data processor" (claim 1)

    o The term "data processor" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

- "channelizer" (claim 1)

    o The term "channelizer" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate the definiteness requirements of 35 U.S.C. § 112.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the

specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

Furthermore, as stated above, at least the terms "signal monitor," "data processor," and "channelizer" invoke 35 U.S.C. § 112, ¶ 6 without sufficient disclosure of corresponding structure, and are therefore indefinite. Pursuant to Patent Rule 3-3(c), these terms, to the extent they can be understood by Defendant, are identified in the prior art, as set forth at least in Exhibits C1-C11.

VI.   THE '362 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits D1 through D6[9] and/or described below anticipate and/or render obvious, alone or in combination, one or more of the asserted claims of the '362 Patent.

1.   The '362 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '362 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits D1 through D6, which identify specific examples of where each limitation of the asserted claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

---

[9] Exhibits D1-D5 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

Defendant identifies the following references as anticipating one or more of the asserted claims of '362 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '362 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

a)   Prior Art Patents and Publications

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent No. 7,265,792	September 4, 2007	Favrat	D1
U.S. Patent App. Pub. No. 2007/0098089 A1	May 3, 2007	Li	D2
WIPO Pub. No. WO 2006/119489 A2	November 9, 2006	McNeely	D3
U.S. Patent No. 6,704,372	March 9, 2004	Zhang	D4
WIPO Pub. No. WO 2007/145637	December 21, 2007	Pugel	D5
U.S. Patent No. 9,210,326	April 21, 2009	Dauphinee	D6

b)   Prior Art Systems

Defendant's further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional information about relevant prior art systems. Defendant reserves the right to further supplement these Invalidity Contentions based on subsequent investigation and discovery, including from third parties. In particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendant further reserves the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendant also incorporates by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

* * * * *

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '362 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '362 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '362 Patent is not explicitly disclosed by any prior art identified above and/or in Exhibits D1 through D6, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits D1 through D6 with each other, at least because all of these references relate to receiving, processing, digitizing, and extracting information from signals, such as broadband and wideband RF signals, on cable television, satellite, and other telecommunication networks. The references set forth above are therefore all in the same or similar fields of endeavor.

90

For example, U.S. Patent No. 7,265,792 ("Favrat") teaches a "television receiver includes a frequency conversion circuit, an analog-to-digital converter, a signal processor, and a signal output circuit. The frequency conversion circuit receives an input RF signal in one of several television signal formats and converts the input RF signal to an intermediate frequency signal. The analog-to-digital converter samples the intermediate frequency signal and generates a digital representation thereof. The signal processor processes the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal and generates digital output signals indicative of information encoded in the input RF signal. Finally, the signal output circuit receives the digital output signals from the signal processor and provides one or more output signals corresponding to the digital output signals." Favrat at Abstract.

Furthermore, U.S. Patent Application Publication No. 2007/0098089 A1 ("Li") teaches a receiver "for receiving data corresponding to a portion of an incoming radio frequency (RF) spectrum, determining a set of estimates including one or more pairs of a channel frequency estimate and a symbol rate estimate from the data via a linear spectrum analysis, and determining a refined set of estimates from the set of estimates via at least one non-linear spectrum analysis. In this way, a blind scan process may be performed to obtain channel estimates in a rapid manner." Li at ¶ [0007].

Furthermore, WIPO Publication No. WO 2006/119489 A2 ("McNeely") teaches an "apparatus (600) includes a receiver (604a-c, 610a-c) for receiving a plurality of digitally multiplexed signals, each digitally multiplexed signal associated with a different physical transmission channel, and for simultaneously recovering from at least two of the digital multiplexes a plurality of bit streams." McNeely at Abstract.

91

In addition, U.S. Patent No. 6,704,372 ("Zhang") teaches "a digital multi-channel demodulator circuit. The demodulator includes a frequency-block down-converter that receives a multi-channel analog RF signal and shifts the multi-channel analog RF signal to a lower frequency band. An ADC receives the multi-channel analog RF signal from the frequency-block down-converter and converts the multi-channel analog RF signal to a multi-channel digital RF signal. A digital channel demultiplexer receives the multi-channel digital RF signal from the ADC and demultiplexes the multi-channel digital RF signal into separate digital RF channels." Zhang at Abstract.[10]

Furthermore, WIPO Publication No. WO 2007/145637 A1 ("Pugel") teaches "a method and apparatus for simultaneous reception of a plurality of digital television channels. Specifically, the apparatus of the present invention is directed to a multichannel receiver circuit including a plurality of amplifier-filter circuits configured to receive a multichannel analog RF input signal, the plurality of amplifier-filter circuits including at least a first amplifier-filter circuit configured to generate a first analog signal including a first band of frequencies and a second amplifier-filter circuit configured to generate a second analog signal including a second band of frequencies. A plurality of analog-to-digital converters is provided, each respectively coupled to one of the plurality of amplifier- filter circuits, the plurality of analog-to-digital converters including at least a first analog-to-digital converter configured to receive the first analog signal and generate a first digital signal and a second analog-to-digital converter configured to receive the second analog signal and generate a second digital signal. A digital tuner is provided, coupled to receive at least the first and second digital signals generated by the plurality of analog-to-digital converters, the digital tuner configured to recover a plurality of digital RF channels." Pugel at ¶ [0010].

---

[10] Zhang was also applied *supra* to the asserted claims of the '008 Patent.

U.S. Patent No. 7,522,901 B2 ("Dauphinee") further teaches "direct sampling tuners [that]can be implemented in, for example, cable modems, satellite set top boxes, cable set top boxes, and the like" that may be used to "reduce[] or eliminate[] mixers, SAW filters, and other analog components." Dauphinee at 1:26-32. In particular, Dauphinee discloses "improved methods and systems fortuning an RF signal. More particularly, the invention is directed to direct sampling tuning for, among other things, cable modems, satellite set top boxes, cable set top boxes, and the like. Direct sampling is performed at or above the Nyquist rate, or at a Sub-Sampling rate." *Id.* at 2:12-17. "In one example," Dauphinee discloses "a front end of the direct sampling tuner includes a low noise amplifier ("LNA). In this example, an entire band is digitized so that the multiple channels can be demodulated using a digital signal processor (DSP)." *Id.* at 1:39-43.

Accordingly, because the identified references are directed to similar devices and techniques in similar fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the teachings of two or more references with a reasonable expectation of success.

> a)   "in a wideband receiver system: downconverting, by a mixer module of said wideband receiver system, a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels" (Claim 11)

To the extent that it is determined that any of the above references do not disclose "in a wideband receiver system: downconverting, by a mixer module of said wideband receiver system, a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Favrat, for example, discloses "[t]he output signal of bandstop filter 113 is then coupled to a mixer 114, controlled by a phase-locked loop 115. Mixer 114 operates to tune the filtered input

RF signal to the desired frequency range in one or more frequency conversions and generate the IF signal. Frequency conversion circuit 110 provides the IF signal on a terminal 116 have a preselected intermediate frequency." Favrat at 4:63-5:2.

Furthermore, Li discloses, for example, "as shown in FIG. 1, the output of LNA 15 is provided to a mixer 20 a, which downconverts the incoming RF signals to an intermediate frequency (IF). While not shown in FIG. 1, it is to be understood that mixer 20 a may mix the incoming signals with a received local oscillator (LO) frequency." Li at ¶ [0024].

McNeely, moreover, discloses, for example, "[t]he RF processing block 210 may contain circuitry for filtering undesired energy outside the signal frequency range, may correct for any frequency response errors introduced, and may amplify the signal to a level necessary for input to the analog to digital (A/D) converter 220. The input RF processing block 210 may also contain any mixing circuits necessary to position the L-band signal in the correct frequency range for operation of the A/D converter 220." McNeely at 11, ll. 5-12.

In addition, Zhang teaches, for example, "[a] digital multi-channel demodulator circuit according to an embodiment of the invention includes a frequency-block down-converter that receives a multi-channel analog RF signal and shifts the multi-channel analog RF signal to a lower frequency band." Zhang at 2:3-7.

Further, Pugel teaches, for example, in claim 14: "digital processor (130) multiplexes said first, second, and third digital signals, downconverts said multiplexed signal and extracts desired information to be coupled to said first and second demodulator circuits (141 , 142)."

Dauphinee also teaches, for example, that "the tuner 100 further includes a digital signal processor ("DSP") 110. In one example, an entire band received at the ADC 106 is digitized so that multiple or desired channels of the band can be demodulated using the DSP 110." Dauphinee

94

at 3:19-24. Dauphinee further instructs that "Optional pre-filter 104 is utilized to reduce the complexity of the ADC 106. As described above, the ADC 106 samples the spectrum of the signal 116. When the optional pre-filter 104 is omitted, the spectrum of signal 116 is effectively the spectrum of a received signal 112. Omission of the pre-filter 104 is typically suitable when the spectrum of interest in the received signal 112 is relatively narrow or when you want to demodulate multiple channels. When the spectrum of interest in signal 112 is relatively broad, however, the pre-filter 104 is optionally utilized to reduce the spectrum sampled by the ADC 106." *Id.* at 4:63-5:6.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **b)** **"digitizing, by a wideband analog-to-digital converter (ADC) module of said wideband receiver system, said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels" (Claim 11)**

To the extent that it is determined that any of the above references do not disclose "digitizing, by a wideband analog-to-digital converter (ADC) module of said wideband receiver system, said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Favrat, for example, discloses "[d]igitizing IF circuit 120 includes a bandpass filter 121, a variable gain amplifier 122 and an analog-to-digital converter (ADC) 123. The IF signal is filtered by bandpass filter 121. Then, amplifier 122 operates on the filtered IF signal for the purpose of

95

regulating the dynamic range of ADC 123. ADC 123 operates to digitize the analog IF signal and provide a digital IF signal on a terminal 124." Favrat at 5:16-23.

As another example, Li discloses, at ¶ [0026], "after filtering, the filtered signals are amplified in a third gain stage 40 a, which may be another PGA, for example. The amplified signals are then passed to an analog-to-digital converter (ADC) 45 a which converts the signals into a digital representation."

McNeely, moreover, teaches, at page 11, line 13, "A/D converter 220 digitizes the processed L-band signal into a series of samples, each sample containing a group of bits."

Furthermore, both Zhang and Pugel disclose this limitation. *See, e.g.,* Zhang at 2:7-10 ("An ADC receives the multi-channel analog RF signal from the frequency-block down-converter and converts the multi-channel analog RF signal to a multi-channel digital RF signal."); Pugel at ¶ [0008] ("A plurality of analog-to-digital converters is provided, each respectively coupled to one of the plurality of amplifier- filter circuits, the plurality of analog-to-digital converters including at least a first analog-to-digital converter configured to receive the first analog signal and generate a first digital signal and a second analog-to-digital converter configured to receive the second analog signal and generate a second digital signal.").

Dauphine also discloses this limitation. For example, Dauphinee discloses "a front end of the direct sampling tuner includes a low noise amplifier ("LNA"). In this example, an entire band is digitized so that the multiple channels can be demodulated using a digital signal processor (DSP)." Dauphinee at 1:39-43; *see also id.* ("Optional pre-filter 104 is utilized to reduce the complexity of the ADC 106. As described above, the ADC 106 samples the spectrum of the signal 116. When the optional pre-filter 104 is omitted, the spectrum of signal 116 is effectively the spectrum of a received signal 112. Omission of the pre-filter 104 is typically suitable when the

spectrum of interest in the received signal 112 is relatively narrow or when you want to demodulate multiple channels. When the spectrum of interest in signal 112 is relatively broad, however, the pre-filter 104 is optionally utilized to reduce the spectrum sampled by the ADC 106.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **c)** **"selecting, by digital circuitry of said wideband receiver system, said plurality of desired television channels from said digitized plurality of frequencies" (Claim 11)**

To the extent that it is determined that any of the above references do not disclose "selecting, by digital circuitry of said wideband receiver system, said plurality of desired television channels from said digitized plurality of frequencies," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Li, for example, discloses "[a]fter fine tuning, the digitized signals are provided to a digital filter 55 a, which may be a narrowband digital filter. In various implementations, filter 55 a may be a variable filter controlled to pass only a desired channel, e.g., corresponding to a selected television channel. Filter 55 a may support both adjacent channel suppression and decimation for various band rates. While the bandwidth of the narrowband filter may vary, in a DBS implementation, a selected channel having a frequency of between approximately 1.0 and 30.0 MHz may be passed." Li at ¶ [0027].

Further, McNeely discloses, for example, "digital channel selector 230 receives the sampled signal and proceeds to select and down-convert each of the individual physical channels that have been selected." McNeely at 11, ll. 28-30.

Furthermore, Zhang teaches, for example, "digital channel demultiplexer 230 then demultiplexes the multi-channel digital RF signal into separate digital RF channels C1 to Cn. The specific implementation of channel demultiplexer 230 will depend on the specific application and requirements. Alternative channel demultiplexer embodiments are described in more detail below (FIGS. 2 and 3). Still referring to FIG. 2, an n×m digital selector 240 receives the demultiplexed digital RF channels C1 to Cn and then selects one or more of the RF channels D1 to Dm from one or more of the digital RF channels C1 to Cn. RF channels C1 to Cn contain content channels that are selected or used by a subscriber." Zhang at 3:60-4:4.

Pugel discloses, for example, at ¶ [0038], "digital tuner 130 may include a channel selector 315 to permit selection of one or more particular digital channels desired to be recovered. For example, a selected set of digital cable television channels may be communicated to the digital tuner 130 via the channel selector 315 corresponding to a plurality of pay- per-view selections desired by members of a household."

Dauphinee further discloses that "in a cable tuner environment, there can be up to 135 channels, or more, within the signal 112. The pre-filter 104 is optionally implemented as a dynamically configurable band pass filter that passes a selectable band of interest, or sub-set of the channels, to the ADC 106. This reduces the linearity, dynamic range, and number of bits required of the ADC 106. In other words, pre-filter 104 reduces the required complexity of the ADC 106." Dauphinee at 5:7-14; *see also id.* at 4:63-5:6 ("Optional pre-filter 104 is utilized to reduce the complexity of the ADC 106. As described above, the ADC 106 samples the spectrum of the signal 116. When the optional pre-filter 104 is omitted, the spectrum of signal 116 is effectively the spectrum of a received signal 112. Omission of the pre-filter 104 is typically suitable when the spectrum of interest in the received signal 112 is relatively narrow or when you want to demodulate

multiple channels. When the spectrum of interest in signal 112 is relatively broad, however, the pre-filter 104 is optionally utilized to reduce the spectrum sampled by the ADC 106.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **d)**   **"outputting, by said digital circuitry of said wideband receiver system, said selected plurality of television channels to a demodulator as a digital datastream" (Claim 11)**

To the extent that it is determined that any of the above references do not disclose "outputting, by said digital circuitry of said wideband receiver system, said selected plurality of television channels to a demodulator as a digital datastream," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Favrat, for example, teaches "[f]or the digital television signals, signal output circuit 440 includes a serializer 442 for converting the processed digital IF signal from the DSP circuit into a serial digital data stream. In this manner, the digital signals for digital television can be provided to a digital demodulator through a serial digital interface." Favrat at 7:59-65.

Additionally, Li discloses, for example, "after being filtered in filter 55 a, the digitized data may be amplified in a fourth gain stage 60 a, which may be a digital amplifier such as a digital VGA. The resulting signals are then provided to further processing circuitry of a receiver, for example, demodulation circuitry 65. Demodulator 65 may be used to demodulate incoming signals, which are modulated according to a selected modulation scheme, such as QPSK, BSPK, or another such modulation scheme." Li at ¶ [0028].

McNeely also teaches this limitation, for example, at page 19, line 22 ("The outputs of the digital channel selector 510 each individually connect to a digital demodulator (demod) 52Oa-M.").

Zhang and Pugel also disclose this limitation. *See, e.g.*, Zhang at 2:13-17 ("embodiments include a digital selector that receives the separate RF channels and selects one or more RF channels, and a plurality of demodulators that receive one or more of the RF channels from the digital selector and demodulate one or more of the RF channels."); Pugel at ¶ [0010] ("in addition to the above a plurality of demodulator circuits is coupled to the digital tuner, the plurality of demodulator circuits including at least a first demodulator circuit configured to receive and demodulate a first channel of the plurality of digital RF channels and a second demodulator circuit being configured to receive and demodulate a second channel of the plurality of digital RF channels.").

Moreover, per Dauphinee, "The DSP 110 can be implemented in one or more of a variety of ways and with one or more of a variety of features. For example, and without limitation, the DSP 110 can perform one or more of channel filtering, equalization, demodulation, decimation, and/or gain control. In the example using the noise-shaping module 108, in one example the noise shaping module is incorporated within the DSP 110. In one example, the LNA 102 and/or the pre-filter 104 can be implemented on a chip with the DSP 110. Additional features that can be implemented in the DSP 110, alone and/or in various combinations with one another, are taught in, for example, the 071 application, which is discussed and incorporated by reference above." Id. 5:46-60.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

        e)   **"outputting, by said digital circuitry of said wideband receiver system, said digital datastream via a serial interface" (Claim 12)**

To the extent that it is determined that any of the above references do not disclose "outputting, by said digital circuitry of said wideband receiver system, said digital datastream via a serial interface," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Favrat, for example, discloses "[f]or the digital television signals, signal output circuit 440 includes a serializer 442 for converting the processed digital IF signal from the DSP circuit into a serial digital data stream. In this manner, the digital signals for digital television can be provided to a digital demodulator through a serial digital interface." Favrat at 7:59-65.

Furthermore, the above limitation would have been obvious because it involves a simple substitution of one known element for another to obtain predictable results. Furthermore, implementing this limitation would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B.   **Invalidity of the '362 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)**

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '362 Patent, to the extent such positions can be understood from Supplemental Plaintiff's

Infringement Contentions, Defendant asserts that the asserted claims of the '362 Patent are invalid

for failure to provide a written description that enables the full scope of the asserted claims and

demonstrates that the inventor had possession of the claimed invention based on at least the

following claim terms, phrases, or limitations:

- "A wideband receiver" and "a wideband analog-to-digital converter (ADC)" (claim 11)

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement

Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of

these claim terms, phrases, and limitations are not described in the specification of the Asserted

Patents and do not enable a person of ordinary skill in the art to practice the claimed invention

without undue experimentation.

C.   Invalidity of the '362 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of

the '362 Patent, to the extent such positions can be understood from Plaintiff's Supplemental

Infringement Contentions, Defendant asserts that the asserted claims of the '362 Patent are invalid

for reciting at least the following claim terms, phrases, or limitations:

- "a plurality of desired television channels and a plurality of undesired television channels" (claim 11)

    o   The terms "desired" and "undesired" are subjective terms that fail to inform a person of ordinary skill in the art of the boundaries of the claimed subject matter.

- "mixer module" (claim 11)

    o   The term "mixer module" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

- "digital circuitry" (claim 11)

o   The term "digital circuitry" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate the definiteness requirements of 35 U.S.C. § 112.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

Furthermore, as stated above, at least the terms "mixer module" and "digital circuitry" invoke 35 U.S.C. § 112, ¶ 6 without sufficient disclosure of corresponding structure, and are therefore indefinite.   Pursuant to Patent Rule 3-3(c), these terms, to the extent they can be understood by Defendant, are identified in the prior art, as set forth at least in Exhibits D1-D6.

VII.   THE '826 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits E1 through E5[11] and/or described below anticipate and/or render obvious, alone or in combination, one or more of the asserted claims of the '826 Patent.

---

[11] Exhibits E1-E5 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

1.   The '826 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '826 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits E1 through E5, which identify specific examples of where each limitation of the asserted claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references as anticipating one or more of the asserted claims of '826 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '826 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

a)   Prior Art Patents and Publications

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent No. 9,686,594	June 20, 2017	Gomez	E1
U.S. Patent No. 5,874,992	February 23, 1999	Caporizzo	E2
U.S. Patent App. Pub. No. 2007/0286311 A1	December 13, 2007	Coyne	E3
U.S. Patent App. Pub. No. 2009/0128708 A1	February 23, 1999	Huffman	E4
U.S. Patent No. 7,403,486	July 22, 2008	Flask	E5

b)   Prior Art Systems

Defendant's further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional information about relevant prior art systems. Defendant reserves the right to further supplement these Invalidity Contentions based on subsequent investigation and discovery, including from third parties. In particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendant further reserves the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendant also incorporates by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

* * * * *

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '826 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '826 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '826 Patent is not explicitly disclosed by any prior art identified above and/or in Exhibits E1 through E5, any

purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits E1 through E5, and Exhibits C1 through C10 cited for the '008 Patent[12], with each other, at least because all of these references relate to receiving and/or analyzing broadband or wideband signals over cable television and telecommunications networks. The references set forth above are therefore all in the same or similar fields of endeavor.

For example, U.S. Patent No. 9,686,594 ("Gomez") teaches "[a] system, method, and apparatus to allow an operator of a broadcast communication system, such as a cable television or satellite television service to provide some examples, to diagnose performance of this communication system remotely. The operator of a first communication device, such as a cable modem termination system (CMTS) to provide an example, may remotely diagnosis performance problems, or potential performance problems, occurring at a second communication device, such as a cable modem (CM) to provide an example, or a group of second communication devices." Gomez at Abstract.

Further, U.S. Patent No. 5,874,992 ("Caporizzo") teaches "a settop terminal which analyses each data packet received by the settop terminal and determines whether the received data packet includes errors. The bit error rate is continually calculated, monitored and stored. When the

---

[12] The '008 and '826 Patents are in the same family, have identical specifications, and both claim priority to U.S. Provisional Patent Application No. 61/532,098. To the extent the asserted claims of the '826 Patent overlap with those of the '008 Patent, the claims of the '826 Patent are invalid for at least the same reasons set forth above for the '008 Patent.

bit error rate exceeds a predetermined threshold, the settop terminal generates a warning signal for transmission to the headend, which diagnoses the problem. In this case the cable system can utilize the results from a group of households that have the same problem in order to isolate the source of failure." Caporizzo at 1:64-2:6.

Furthermore, U.S. Patent Application Publication No. 2007/0286311 A1 ("Coyne") teaches "a channelized receiver" having extended capabilities to enable a communications system "to perform electronic surveillance monitoring (ESM)", "receive, process and provide information to downstream devices," provide "wideband communications capability," and which includes "a programmable demodulator for extracting communications data from incoming signals." Coyne at Abstract.

Additionally, U.S. Patent Application Publication No. 2009/0128708 A1 ("Huffman") discloses a "multimedia signal monitoring unit" that includes "a multimedia signal receiver for receiving an encoded multimedia stream, and a plurality of decoders." Huffman at Abstract. Further, the "monitoring unit includes an analysis module employing multiple algorithms for demodulating and analyzing a digital multimedia signal." *Id*. at ¶ [0012].

Furthermore, U.S. Patent No. 6,704,372 ("Zhang") teaches "a digital multi-channel demodulator circuit. The demodulator includes a frequency-block down-converter that receives a multi-channel analog RF signal and shifts the multi-channel analog RF signal to a lower frequency band. An ADC receives the multi-channel analog RF signal from the frequency-block down-converter and converts the multi-channel analog RF signal to a multi-channel digital RF signal. A digital channel demultiplexer receives the multi-channel digital RF signal from the ADC and demultiplexes the multi-channel digital RF signal into separate digital RF channels." Zhang at Abstract.

107

U.S. Patent No. 8,582,694 ("Velazquez") discloses "a dynamic channelizer that is adaptively tuned based on detected signals, . . . a powerful software reconfigurable digitizer that is adaptively optimized for the current signal environment to control important receiver parameters such as bandwidth, dynamic range, resolution, and sensitivity." Velazquez at This approach adaptively adjusts the signal processing to provide optimal performance for the current signal environment. The adaptive adjustment uses heuristic and iterative approaches for identification of signals of interest and jammer/interference signals for tuning the digital channelizer and for selecting appropriate high-performance digital signal processing techniques to trade off bandwidth, dynamic range, resolution, and sensitivity." Velazquez at 1:46-58.

Furthermore, U.S. Patent No. 8,424,049 ("Skelly") teaches "[a] video signal is provided to a set top box. An instruction to record a specified portion of the video signal, thereby creating a video sample, is provided to the set top box. The video sample is received from the set top box. Reference video corresponding to the video sample is obtained. A comparison of the video sample and the reference video is performed." Skelly at Abstract.

Furthermore, U.S. Patent No. 5,808,671 ("Maycock") teaches an "[a]pparatus for and a method of monitoring the transmission of an analog video signal through a video signal transmission channel, e.g. a fiber optic cable from a headend capturing the analog video signal at a location remote from the headend and select a signal channel from the captured video signal. The selected signal channel is digitized and serialized as a digital signal and the digital signal is transmitted as an optical signal through an optical fiber cable to a monitoring location, where the digital signal is converted to an analog video signal which is displayed on a video monitor." Maycock at Abstract.

In addition, U.S. Patent Application Publication No. 2005/0114879 A1 ("Kamieniecki") teaches that "[i]nformation related to signal quality on the downstream and upstream paths [] in a cable network may be monitored [] at selected ones of a plurality of set-top boxes [] and sent by the set-top box to the headend [] as it is collected, or when the set-top box is polled by the headend." Kamieniecki at Abstract.

Furthermore, U.S. Patent No. 7,403,486 ("Flask") teaches "[a]n apparatus that includes a coupling, a signal level measurement circuit, a communication circuit and a processing circuit. The coupling is configured to connect to and received broadband RF signals from a coaxial cable termination of a communication network. The signal level measurement circuit is operably coupled to the coupling, and is operable to generate signal level measurements regarding a first set of the broadband RF signals." Flask at Abstract.

Accordingly, because the identified references are directed to similar devices and techniques in similar fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the teachings of two or more references with a reasonable expectation of success.

> a)   **"one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, teaches a "service provider location 102 manages the upstream and the downstream transfer of the video, audio, and/or data to and/or from the subscriber locations 104.1 through 104.n. The service provider location 102 provides its video, audio, and/or data in

109

the downstream through a communication channel 106 to the subscriber locations 104.1 through 104.n. The communication channel 106 may be characterized as an interface between the service provider location 102 and the subscriber locations 104.1 through 104.n. The communication channel 106 may include, but is not limited to, a microwave radio link, a satellite channel, a fiber optic communication cable, a hybrid fiber optic communication cable system, a copper communication cable, or a concatenation of any combination of these, and including relays and frequency translations, to provide some examples." Gomez at 4:4-19.

Similarly, Caporizzo teaches, for example, a "CATV transmission network 5 begins with a plurality of coaxial or fiber optic trunk lines 40 coupled to the headend 15. Some portions of the CATV plant may use fiber optic cables instead of coaxial transmission cables." Caporizzo at 2:46-49.

Similarly, Huffman teaches, for example, "regional office 102 delivers multimedia signal 103 to receiver(s) 104 over a wired access network, which may have a physical medium implemented with twisted copper cable, coaxial cable, fiber optic cable, any combination thereof, or a suitable alternative." Huffman at ¶ [0019].

See also Flask at 3:25-45 ("FIG. 1 shows an exemplary test configuration that employs an analysis device 100 according to the present invention within a communication network 110. The communication network 110 is a land-based broadband network typically known as a cable network. In the embodiment described herein, the communication network 110 is a hybrid fiber coax or HFC network that employs both fiber optic links and coaxial cable to effect radio frequency communications between a plurality of subscribers and a network headend 112. The network headend 112 is further operable to provide Internet communications between a plurality of subscribers and one or more devices 152 connected to the Internet 150. The devices 152 are

110

external to the communication network 110. The analysis device 100 is operable to test multiple

parameters of the network, including by way of example, the signal strength at a remote location

of the network 110, whether Internet connectivity is available at remote locations of the network

110, and/or digital channel quality at remote locations of the network 110. The precise combination

of features in the analysis device 100 may vary from embodiment to embodiment.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine

one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so

with a reasonable expectation of success.

> **b)** **"receiving, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose

"receiving, via said HFC network, a signal that carries a plurality of channels, wherein said

channels comprise one or both of television channels and data channels," as claimed, it would have

been obvious to modify the teachings of that reference to include this feature at least in view of

the following exemplary teachings.

For example, Gomez teaches "[a] communication system 100 facilitates bi-directional

communication of information, such as video, audio, and/or data to provide some examples,

between a service provider location 102 and one or more subscriber locations 104.1 through

104.n." Gomez at 3:50-54. *See also id.* at 1:26-31 ("A cable system is a system of providing

television, internet data, and/or other services from a cable service provider to cable service

subscribers via radio frequency signals transmitted to one or more customer premises through, but

not limited to, optical fibers and/or coaxial cables.") (Background of the Invention).

111

Similarly, in its Background of the Invention, Caporizzo discloses "[c]able television (CATV) communication networks are being used more frequently for applications that require transmission of data, in addition to analog audio and video information. With the onset of utilizing CATV networks for data-critical applications (such as home banking and shopping) and life-saving applications (such as medical alert and alarm services), transmission of error-free data has become a necessity."

Coyne, moreover, discloses, for example, "[i]n some embodiments, channelizer 240 de-multiplexes the output of ADC 230 to separate it into different communication sets, such as voice data, video, data streams, other information, or a combination thereof." Coyne at ¶ [0030].

Huffman, for example, further discloses, at ¶ [0016], "regional office 102 may receive multiple multimedia signals 103 including one or more broadcast multimedia signals and one or more multimedia signals delivered via a backbone connection to the national headend. In this manner, regional office 102 may combine and deliver, to its subscribers, national 'feeds' as well as regionally or locally broadcasted content. Regional office 102 may also insert content such as regional or local advertising, insert metadata such as electronic programming guide information." *See also* Flask at 6:5-14 ("A portion of the broadband signal is reserved for downstream and upstream data packet communication. The data packet communication in the embodiment described herein comprises data to be communicated using TCP/IP standards, and which may be communicated to remote computers 152 over the Internet 150. The CMTS 134 effectively transmits downstream data packets to cable modems 130 using known modulation techniques, and receives upstream data packets from the cable modems 130 using known demodulation techniques.").

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

c) "digitizing said received signal to generate a digitized signal" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "digitizing said received signal to generate a digitized signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the exemplary teachings set forth with respect to the '008 Patent. *See supra* at § V.A.2.a).

d) "selecting a first/second portion of said digitized signal" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "selecting a first [or second portion] of said digitized signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the exemplary teachings set forth with respect to the '008 Patent. *See supra* at § V.A.2.e).

e) "processing said selected second portion of said digitized signal to recover information carried in said plurality of channels" (Claim 1)

To the extent that it is determined that any of the above references do not disclose "processing said selected second portion of said digitized signal to recover information carried in said plurality of channels," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the exemplary teachings set forth with respect to the '008 Patent. *See supra* at § V.A.2.d).

f) **"analyzing said selected first portion of said digitized signal to measure a characteristic of said received signal" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "processing said selected second portion of said digitized signal to recover information carried in said plurality of channels," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the exemplary teachings set forth with respect to the '008 Patent. *See supra* at § V.A.2.b).

g) **"controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal, wherein said measured characteristic is different than said network management message" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal, wherein said measured characteristic is different than said network management message," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the exemplary teachings set forth with respect to the '008 Patent. *See supra* at § V.A.2.c).

h) **"wherein said network management messages indicate whether a parameter is outside of acceptable bounds" (Claim 2)**

To the extent that it is determined that any of the above references do not disclose "wherein said network management messages indicate whether a parameter is outside of acceptable bounds," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Gomez discloses "[t]he parameter measurement module 406 may additionally provide the one or more signal parameters, or the indications of the one or more signal parameters, as one or more signal parameters 464 which are in turn provided to the service provider

114

by the transmitter 408 to remotely diagnose performance problems, or potential performance problems, within the communication system in real time." Gomez at 12:58-64.

Furthermore, Caporizzo discloses, for example, "[w]hen the bit error rate exceeds a predetermined threshold, the settop terminal generates a warning signal for transmission to the headend, which diagnoses the problem. In this case the cable system can utilize the results from a group of households that have the same problem in order to isolate the source of failure." Caporizzo at 2:1-6 (Background of the Invention).

Huffman, moreover, discloses, for example, "[t]o quantify the quality of an incoming signal, monitoring unit 106 may monitor parameters including packet error rate for decoding the signal into packets; the signal-to-noise ratio after equalization and phase correction, at the point where the signal goes into a decoder." Huffman at ¶ [0024].

Flask, moreover, discloses, for example, "the control processor 370 receives the information representative of the delay, packet loss and jitter in the VoIP connection. In step 1045, the control processor displays information representative of the delay, packet loss and jitter. The control processor 370 optionally compares one or more these values with one or more thresholds to provide an indication of whether the values are within one or more predetermined limits. Multiple thresholds may be used to define different measures of quality." Flask at 28:35-46.

Furthermore, indicating that a parameter is outside of acceptable bounds would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> ### i)   **"wherein said parameter is a modulation parameter of said received signal" (Claim 3)**

To the extent that it is determined that any of the above references do not disclose "wherein said parameter is a modulation parameter of said received signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, teaches that "one or more plant diagnostic tools measure various signal parameters of various signals within the communication system 100 and provide these signal parameters to the service provider location 102. The signal parameters may include one or more of spectral density, received signal strength, relative strength of different channels and services, noise floor and interference, transmitter frequency offsets, *and/or any other suitable signal parameter that will be apparent to those skilled in the relevant art(s)* without departing from the spirit and scope of the present disclosure. The service provider location 102 may then use these signal parameters to remotely diagnose the performance problems, or the potential performance problems, within the communication system 100 in real time." Gomez at 4:61-5:7 (emphasis added).

Maycock, moreover, discloses, for example, "[t]he critical parameters of cable television system performance comprises the quality of the picture and the audio signal." 1:31-33. *See also, e.g.*, Velazquez at 1:59-63 ("The present invention employs a signal detection algorithm that uses techniques such as statistical, spectral, and wavelet analysis to identify the location, bandwidth, level, and modulation type of signals of interest and jammer/interference signals.").

Furthermore, providing an indication of a modulation parameter would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

j) "wherein said parameter is a transmit power of said received signal" (Claim 4)

To the extent that it is determined that any of the above references do not disclose "wherein said parameter is a transmit power of said received signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Gomez, for example, discloses "[an] operator of the service provider location 102 may adjust a frequency allocation, such as a channel-line up to provide an example, of various signals within the communication system 100, a relative power level within one or more channels of the frequency allocation." Gomez at 5:51-56. *See also id.* at 4:61-66 ("The one or more plant diagnostic tools measure various signal parameters of various signals within the communication system 100 and provide these signal parameters to the service provider location 102. The signal parameters may include one or more of spectral density, received signal strength.").

Further, in its Background of the Invention section, Maycock discloses "[t]o determine the quality of its transmission, cable TV operators have relied upon the measurement of operating parameters of amplifiers employed in co-axial cable in the system as an indirect indication of the transmitted signal quality passing through the amplifiers. Data derived from the parameters, such

117

as power, temperature, and housing status (i.e. open or closed), is encoded by a status monitoring modem and transferred into a return path frequency allocation of the co-axial cable, typically in the frequency band 5 to 35 MHZ." Maycock at 1:15-24. *See also* Flask at 26:24-26 ("The SNR and received power level of the test CM is measured directly by the CMTS 134, which may suitably include an SLM device similar to that of the device 300.").

Furthermore, providing an indication of a transmit power of a received signal would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

k) "wherein said characteristic is signal power/phase vs. frequency" (Claims 6 and 7)

To the extent that it is determined that any of the above references do not disclose "wherein said characteristic is signal power [or phase] vs. frequency," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

As noted above, Gomez, for example, teaches "signal parameters may include one or more of spectral density, received signal strength, relative strength of different channels and services, noise floor and interference, transmitter frequency offsets, *and/or any other suitable signal parameter that will be apparent to those skilled in the relevant art(s)* without departing from the spirit and scope of the present disclosure." Gomez at 4:64-5:3 (emphasis added). *See also id.* at 12:39-44 ("one or more signal parameters may include a spectral density, a received signal

strength, a relative strength of different channels and services, noise floor and interference, transmitter frequency offset, and/or any other suitable parameter that will be recognized by those skilled in the relevant art(s)").

Huffman, moreover, discloses, for example, "computer program 508 may include analysis module 515, which may include computer executable instructions stored in computer program 508 for use in analyzing the decoded multimedia stream from circuit boards 405. Analysis module 515 may determine characteristics of the stream including packet error rate for decoding the signal into packets, signal-to-noise ratio after equalization and phase correction." Huffman at ¶ [0031]. *See also, e.g.*, Velazquez at 11:26-29 ("For each test signal, a buffer of approximately 128K samples is captured and the FFT spectrum is analyzed to measure the relative amplitude and phase shift of each of the distortion components.").

Furthermore, measuring signal power or phase vs. frequency of a signal would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> l)   **"wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate" (Claim 8)**

To the extent that it is determined that any of the above references do not disclose "wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

119

Gomez, for example, teaches "[t]he signal parameters may include one or more of spectral density, received signal strength, relative strength of different channels and services, noise floor and interference, transmitter frequency offsets, and/or any other suitable signal parameter that will be apparent to those skilled in the relevant art(s)." 4:64-5:2.

Furthermore, Caporizzo discloses, for example, in its Background of the Invention, "[o]ne method for measuring the signal-to-noise ratio on a cable television system without taking the system out of service is disclosed in U.S. Pat. No. 5,073,822 (Gamm et al.). This system uses a modified spectrum analyzer for determining signal-to-noise ratios at certain locations within the CATV network." Caporizzo at 1:42-48.

Huffman, moreover, discloses, for example, "[t]o quantify the quality of an incoming signal, monitoring unit 106 may monitor parameters including packet error rate for decoding the signal into packets; the signal-to-noise ratio after equalization and phase correction." Huffman at ¶ [0024]. *See also, e.g.*, Maycock at 6:23-26 ("The video analyzer 62 measures signal quality parameters such as signal-to-noise ratio, differential gain, differential phase and other video parameters."). *See also* Flask at 26:24-26 ("The SNR and received power level of the test CM is measured directly by the CMTS 134, which may suitably include an SLM device similar to that of the device 300.").

Furthermore, measuring any of signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and/or symbol error rate of a signal would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the

claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **m)   "configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal" (Claim 9)**

To the extent that it is determined that any of the above references do not disclose "configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Coyne teaches "[i]n channelized receiver 100, input energy is provided to channelizer 110, which includes multiple filters 110 1, 110 2 . . . 110 n. Each filter in filter bank 110 has a different center frequency, with the filters being ordered in accordance with their center frequencies." Coyne at ¶ [0005].

Further, Huffman, at ¶ [0018], discloses, for example, "[i]n a coaxial based system, for example, in which regional office 102 transmits all or substantially all available channels of multimedia content to the end user simultaneously, the desired multimedia signal 103 may correspond to particular frequency band and receiver 104 may be operable as a tuner that selects multimedia signal 103 from the composite signal."

Zhang, furthermore, discloses, for example "[n]umeric oscillator 310(1) generates a frequency, or 'target' frequency, that matches the characteristic frequency of a desired RF channel, or 'target' RF channel. The output of NCO 310(1) is multiplied by all the RF channels received at complex multiplier 320(1). When an multi-channel RF signal is multiplied with the output of NCO 310(1), the frequency of target RF channel signal is shifted to a desired channel. In some

embodiments of the present invention, the target RF channel is shifted to a baseband, i.e., centered at DC." Zhang at 4:52-61.

Additionally, Velazquez discloses, for example, "[t]he adaptive real-time control algorithm employs blind adaptive background analysis and heuristic analysis to dynamically adjust parameters of the DSP algorithms 320, e.g., frequency response, center frequency, and/or bandwidth, for optimal performance." Velazquez at 8:4-8.

Further, Flask discloses, for example, "[t]he frequency conversion circuit 308 is a circuit that converts the frequency of an incoming broadband signal such that a select channel frequency of between 4 and 1000 MHz is centered about a predetermined intermediate frequency (IF)." Flask at 8:12-16.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B. Invalidity of the '826 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '826 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '826 Patent are invalid for failure to provide a written description that enables the full scope of the asserted claims and demonstrates that the inventor had possession of the claimed invention based on at least the following claim terms, phrases, or limitations:

- "controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal, wherein said measured characteristic is different than said network management messages" (claim 1)

122

> o The specification and drawings of the '826 Patent do not describe network management messages being different than a measured characteristic, demonstrating at least that the inventor was not in possession of the claimed invention.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C.   Invalidity of the '826 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '826 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defend ants assert that the asserted claims of the '826 Patent are invalid for reciting at least the following claim terms, phrases, or limitations:

- "performing by one or more circuits of a receiver" (claim 1)

  - o The term "one or more circuits" invokes 35 U.S.C. § 112 ¶ 6 without disclosure of sufficient corresponding structure, thereby rendering the term indefinite.

- "wherein said network management messages indicate whether a parameter is outside of acceptable bounds" (claim 2)

  - o The term "acceptable" is a subjective term that fails to inform a person of ordinary skill in the art of the boundaries of the claimed subject matter.

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate the definiteness requirements of 35 U.S.C. § 112.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the

specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

Furthermore, as stated above, at least the term "one more circuits" invokes 35 U.S.C. § 112, ¶ 6 without sufficient disclosure of corresponding structure, and is therefore indefinite. Pursuant to Patent Rule 3-3(c), these terms, to the extent they can be understood by Defendant, are identified in the prior art, as set forth at least in Exhibits E1-E5.

VIII.   THE '682 PATENT IS INVALID

A.   Identification of Prior Art

Defendant contends that the prior art references charted in Exhibits F1 through F6[13] and/or described below anticipate and/or render obvious, alone or in combination, one or more of the asserted claims of the '682 Patent.

1.   The '682 Patent is Anticipated by the Prior Art

Some or all of the asserted claims of the '682 Patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits F1 through F6, which identify specific examples of where each limitation of the asserted claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

---

[13] Exhibits F1-F5 were served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

Defendant identifies the following references as anticipating one or more of the asserted claims of '682 Patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '682 Patent. Further, Defendant contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following tables.

a)   Prior Art Patents and Publications

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. Patent App. Pub. No. 2012/0269242 A1	October 25, 2012	Prodan	F1
U.S. Patent App. Pub. No. 2007/0223512 A1	September 27, 2007	Cooper	F2
U.S. Patent App. Pub. No. 2009/0219856 A1	September 3, 2009	Richardson	F3
U.S. Patent No. 7,751,338	July 6, 2010	Azenko	F4
U.S. Patent App. Pub. No. 2004/0085987 A1	May 6, 2004	Gross	F5
U.S. Patent App. Pub. No. 2013/0041990 A1	February 14, 2013	Thibeault '990	F6

b)   Prior Art Systems

Defendant's further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional information about relevant prior art systems. Defendant reserves the right to further supplement these Invalidity Contentions based on subsequent investigation and discovery, including from third parties. In

particular, Plaintiff has not yet produced art relevant to the systems in its control and/or in the control of any former officers and employees.

Defendant additionally reserves the right to rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendant further reserves the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendant also incorporates by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

* * * * *

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '682 Patent, Defendant contends that any difference between that prior art and the corresponding patent claim would have been obvious to a person of ordinary skill in the art, even if Defendant has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2.   The '682 Patent Would Have Been Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '682 Patent is not explicitly disclosed by any prior art identified above and/or in Exhibits F1 through F6, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The prior art would have, therefore, rendered the relevant claims invalid as obvious under 35 U.S.C. § 103.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits F1 through F6 with each other, at least because all of these references relate to the grouping of devices and network elements (such as, for example, cable modems) in cable television and other

126

telecommunication networks. The references set forth above are therefore all in the same or similar fields of endeavor.

For example, U.S. Patent Application Publication No. 2012/0269242 A1 ("Prodan") teaches a system in which "measured signal strength versus frequency profiles may be used to group CMs into multiple categories, which are then used as the basis for the assignment of upstream transmission frequency bands, or when a preferred frequency band is unavailable, for assignment of lower capacity modulation schemes to CMs." Prodan at ¶ [0044].

Furthermore, U.S. Patent Application Publication No. 2007/0223512 A1 ("Cooper") discloses techniques "directed toward configuring logical channels in a network. More particularly, this disclosure is directed toward grouping network elements according to certain parameters to configure logical channels in a network." Cooper at ¶ [0002].

In addition, U.S. Patent Application Publication No. 2009/0219856 A1 ("Richardson") teaches "[a] communication system receives attributes associated with access terminals within a cell and groups them in accordance with similarities between the received attributes. Resource assignment messages customized to their respective attributes are transmitted to the groups, thereby ensuring that all groups receive these messages." Richardson at Abstract.

Moreover, U.S. Patent No. 7,751,338 ("Azenko") discloses "[a] process for grouping cable modems by type/modulation profile and/or throughput ability into different logical groups. Each logical group is commanded to transmit on an upstream which has a burst profile set to effectively use the throughput ability of the cable modem." Azenko at Abstract.

U.S. Patent Application Publication No. U.S. 2004/0085987 A1 ("Gross"), moreover, discloses communication devices that "may be actuated in groups of two or more, and parameter

127

sets determined accordingly; or various combinations of single and group actuations may be performed and the corresponding parameter sets determined." Gross at ¶ [0098].

U.S. Patent Application Publication No. 2013/0041990 A1 ("Thibeault '990"), moreover, discloses that "A network element is registered on a physical channel and a first logical channel. The network controller receives ranging messages from which network element parameters associated with the network element are determined, and the network determines if the network element is better suited for a different logical channel on the network. The network controller provides an upstream channel change override signal to the network element, instructing the network element to re-register to another logical channel." Thibeault '990, at Abstract.

Accordingly, because the identified references are directed to similar devices and techniques in similar fields of endeavor, a person of ordinary skill in the art would have been motivated to combine the teachings of two or more references with a reasonable expectation of success.

a) **"determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Prodan teaches "[i]n an embodiment, the signal strength versus frequency profiles of the CMs are measured at the headend. Alternatively, the profiles may be measured at a cable modern termination system (CMTS) that sits between the CMs and the headend, and then

provided to the headend. Different measures may be associated with the received signal strength, including, for example, the SNR, the bit error rate (BER), etc." Prodan at ¶ [0032].

Furthermore, Cooper, discloses, for example, "a microprocessor configured to determine network parameters associated with a selected network element based on communications with the selected network element; and a receiver configured to receive signals indicative of the network parameters from a network element, wherein the microprocessor is configured to assign the network element to a logical channel based on the network parameters. The network parameters may include one of: upstream or downstream modulation error ratio (MER), upstream or downstream signal to noise ratio (SNR)." Cooper at ¶ [0008].

In addition, Azenko discloses, for example, "[d]uring initial training or ranging of each modem, the CMTS calculates SNR and/or monitors the received power. If after the maximum number of attempts to correct inadequate received power or inadequate SNR, acceptable received power or SNR is not achieved, the CMTS moves the CMs with problems to a lower throughput, more robust upstream channel so that effective communications for registration purposes can be achieved with each CM." Azenko at 3:34-42.

In a similar field of endeavor, Richardson discloses, for example, "[a]t AP 110 x, the transmitted and modulated signals from the ATs are received by antenna 218, processed by a receiver unit 232, and demodulated and decoded by an RX data processor 234. The decoded signals can be provided to a data sink 236. Receiver unit 232 may estimate the received signal quality (e.g., the received signal-to-noise ratio (SNR)) for each terminal and provide this information to controller 220." Richardson at ¶ [0043].

Furthermore, Thibeault '990 discloses, for example, "[i]n the apparatus, the network element parameters may include a modulation error ratio (MER) or a signal to noise ratio (SNR).

The microprocessor may compare the network parameters with threshold values and assigns the network elements to a logical channel based on the comparison. The microprocessor may provide instructions to the network element to re-assign to a third logical channel different from the second logical channel. The microprocessor may assign the network element to the second logical channel using an upstream channel override signal." Thibeault '990 at ¶[0009].

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **b)** **"assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Prodan, for example, discloses "CMs are grouped based on their signal strength versus frequency profiles into multiple categories. The category that a CM belongs to governs frequency band allocation to the CM." Prodan at ¶ [0034]. *See also id.* at ¶ [0044] ("In addition, the measured signal strength versus frequency profiles may be used to group CMs into multiple categories, which are then used as the basis for the assignment of upstream transmission frequency bands, or when a preferred frequency band is unavailable, for assignment of lower capacity modulation schemes to CMs."); *id.* at ¶ [0044] ("embodiments extend to any algorithm that makes uses of measured/estimated/anticipated signal strength versus frequency profiles to optimize one or more

performance parameters (e.g., power utilization, SNR levels, transmit powers, throughput, network load, etc.) according to a set of constraints (e.g., limited upstream frequency spectrum, available upstream frequency bands, maximum CM transmit power, minimum required SNR, minimum required throughput per CM/flow, flow priority, etc.). As described above, in practice, embodiments may be implemented by grouping CMs into different categories, thus making the optimization more tractable.").

Cooper, furthermore, teaches, for example, "Performance parameters 1020 could include: . . . upstream or downstream signal to noise ratio (SNR) . . . A threshold (appropriate to the network element parameter selected) is preferably specified for each logical channel to allow the application to isolate (or group) the various network elements into logical channels based upon the threshold." Cooper at ¶ [0037].

In addition, Azenko discloses, for example, "grouping is first done on type with monitoring of SNR and/or received power during initial training and subgrouping of CMs with power shortfall or bad SNR to lower power." Azenko at 2:11-14. *See also id.* at 5:15-19 ("Subgroupings can be based upon: the received signal-to-noise ratio; the packet loss rate; the bit error rate; the byte error rate; the received signal power; the RS codeword error rate or the cable node to which a cable modem is coupled.").

Thibeault '990, moreover, discloses "an exemplary process performed by a CMTS for automatically registering a network element on a preferred logical channel … a network element is registered with a CMTS port on a first logical channel, such as logical channel 0. Network element parameters, e.g. ranging messages, which are indicative of the performance capabilities of the network element are read by the CMTS … The network element parameters may indicate the network element's MER (SNR) value on the logical channel, as well as other characteristics.

131

… the network element parameters are compared against a parameter table containing a table of one or more parameter thresholds associated with a logical channel available on the network to determine if the CMTS needs to reassign that modem to a different logical channel on the currently used physical upstream port." Thibeault '990 at ¶[0032].

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> c) **"generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Cooper, for example, teaches, at ¶ [0033], "[a] channel configuration window" that an operator can use to "quickly decipher what proportion of the modems (e.g., 75%) possess a network element parameter greater than THRESHOLD1 and less than THRESHOLD2. This understanding is useful in allowing the operator to identify which parameters should be utilized as a basis for grouping network elements into various logical channels and as a basis to select necessary thresholds."

132

Prodan, furthermore, discloses, for example, "embodiments address the problem of allocation of frequency bands to CMs in a cable network as an optimization problem having known fixed constraints (e.g., maximum cable modem transmit power, minimum required signal strength at headend, etc.) and an objective function (e.g., overall power utilization in the network, variance in signal strength among CMs at the headend, etc.) to minimize/maximize." Prodan at ¶ [0029].

As a further example, Richardson teaches, in the area of cellular communications, "power requirements vary as a function of AT location within a cell as well as SNR, and other factors. Moreover, size of bit masks impacts resource utilization as well. Conventional systems typically assign bit masks as a function of worst case scenarios in order to mitigate loss of assignment information to ATs." Richardson at ¶ [0049].

Additional examples of this limitation are disclosed by Gross and Azenko. *See, e.g.*, Gross at ¶ [0100] ("FIG. 5C shows a number of sets 45 a-49 d of bit allocations for the subchannels 49 e and which may represent a corresponding number of different communication devices or conditions associated with communications over these subchannels. A single composite parameter set 49 f may be formed as a function of the parameter sets 49 a-49 d by, for example, selecting, for each subchannel, the minimum bit allocation among the sets 49 a-49 d for each of the subchannels 49 e. Such a set represents a 'worst case' condition for activation of any of the devices associated with the sets 49 a-49 d."). *See also* Azenko at 14:13-25; 15:56-63.

Thibeault '990 discloses "parameter thresholds could be as follows: QPSK is set to an MER of 16; 16QAM is set to an MER of 22; 32QAM is set to an MER of 25; and 64QAM is set to an MER of 28. When a modem as the network element registers on logical channel 0 and its MER (SNR) value is 27 the CMTS card will issue an upstream channel override to that particular modem to re-register on logical channel 2 (32QAM) because its MER (SNR) says it can pass data cleanly

at that modulation mode. The 32QAM mode will allow the modem the ability to generate better throughput because 32QAM has more bandwidth than the QPSK channel it would have stayed on when it registered the first time. The opposite can happen also if a modem registers on the 32QAM channel but its MER (SNR) value is 18, then it will be directed to override and re-register on lower modulation profile mode (lower bandwidth mode), e.g., logical channel 0 (QPSK). By doing this all the modems will be on the best modulation mode (best bandwidth) it can support and therefore increase throughput potential for all subscribers." Thibeault '990 at ¶[0033].

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

> **d)** **"selecting, by said CMTS, one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric" and "communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter" (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "selecting, by said CMTS, one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric" and/or "communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

For example, Prodan discloses "[f]requency spectrum and modulation scheme assignment according to embodiments may be performed dynamically . . . In addition, the frequency allocation scheme and the modulation scheme assignment can be made per CM or per flow. When per flow assignment is used, different flows from the same CM may be transmitted using different frequencies bands and modulation schemes." Prodan at ¶ [0046]. *See also id.* at ¶ [0047] ("Specifically, embodiments extend to any algorithm that makes uses of measured/estimated/anticipated signal strength versus frequency profiles to optimize one or more performance parameters (e.g., power utilization, SNR levels, transmit powers, throughput, network load, etc.) according to a set of constraints (e.g., limited upstream frequency spectrum, available upstream frequency bands, maximum CM transmit power, minimum required SNR, minimum required throughput per CM/flow, flow priority, etc.").

Cooper, moreover, discloses, for example, at ¶ [0039], "[s]ystem performance may include many things including: maximum through-put, maximum number of network elements supported, quality of service (QOS) performance, ease of manageability from the service provider perspective, and others. As such, the system may automatically determine the optimum value for the threshold settings or it may allow an operator to analyze his network and manually select the desired threshold settings." *See also* Azenko at 12:34-40 ("This method divides up the CMs into at least two groups. One group transmits on one logical channel with a high throughput and which contains only CMs which do not have a high attenuation path or at least which have adequate power and/or adequate SNR to meet the received power and/or SNR specification at the CMTS.")

Furthermore, Gross discloses, for example, in the area of voice communications, "measurements of the SNR levels across a number of the subchannels during a given communications condition or state provides a 'fingerprint' which may reliably be used to quickly

135

select a parameter set, such as the set of bit allocations or the set of gains, for use in subsequent communications during that state." Gross at ¶ [0043]. In the area of cellular communications, Richardson discloses, for example, "controller 220 may provide power control (PC) commands that are used to adjust transmit power of active ATs, and scheduler 230 may provide assignments of carriers for the ATs. These various types of data may be sent on different transport channels." Richardson ¶ [0039].

Thibeault '990, furthermore, discloses that a "system preferably allows an operator to automatically configure the CMTS to best align the network elements with the available logical channels. The invention provides a cost effective manner for improving network element throughput, providing higher data speeds to subscribers. The total network throughput may also be increased in addition to individual subscriber throughput because each network element will be running at its best possible modulation mode and it should not bring other modems down (to a lower bandwith) with it. All the modems that can only run in QPSK will be on the QPSK channel, the modems that can run at 16QAM will be on the 16QAM channel and so on. The invention may be done in real time so there are no operator configuration changes or intervention where they could make a mistake and assign a network element to the wrong channel." Thibeault '990 at ¶[0016].

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

136

e)   **"wherein said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate" (Claim 2)**

To the extent that it is determined that any of the above references do not disclose "wherein said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

As one example, Prodan discloses "a multiplicity of modulation schemes may be determined for each CM, e.g., based on the favored and second-favored, etc., frequency bands for each CM, and then the modulation scheme may be assigned dynamically depending on the existing needs and priorities (QoS) of an individual CM in view of the needs and priorities of the collection of CMs in the network." Prodan at ¶ [0045].

Similarly, Cooper discloses, for example, a "Modulation Profile display panel" that "provides the ability for the operator to configure various profile configuration templates which may later be assigned to an individual logical channel." Cooper at ¶ [0036]. Using the Modulation Profile display panel, an "operator may view, create and edit modulation profiles [] which optimize the specific needs of a subset of the network elements." *Id.   See also* Azenko at 12:43-47 ("modems are grouped to transmit on a different logical channel with a more robust burst profile (more overhead for FEC) and lower throughput. The burst profile for this logical channel will be such as to be able to handle the lower received power and/or the lower SNR.")

In the area of cellular communications, Richardson discloses, for example, "messages are transmitted to various groups based on their SNR conditions. Each group corresponds to one interlace of traffic resource . . . groups closer to the AP can have higher SNR values and thereby

137

their bit masks may be transmitted with lower power whereas groups having lower SNR values will require bit masks to be transmitted with higher power." Richardson at ¶ [0077]. *See also* Gross at ¶ [0034] ("changes in power level (and corresponding changes in bit allocation and other communication parameters) for communications in either the upstream or the downstream direction, or both, may be made, and sets of control parameters may be defined on these power levels as well for use in controlling communications.").

In a similar filed of endeavor as the '682 Patent, Thibeault '990 discloses that "[t]he network can differentiate cable modems by Modulation Error Ratio (MER) which is a primary determinant in the modulation rate (QPSK, 16QAM, 32QAM, 64QAM, etc) that may be run, and then set up multiple logical channels, each one with a different modulation rate, and then assign the appropriate network elements to each logical channel based upon which modulation could be supported." Thibeault '990 at ¶[0024].

Furthermore, selecting transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and/or FEC code rate would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

>   f)   **"wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating." (Claim 1)**

To the extent that it is determined that any of the above references do not disclose "wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of

subcarriers for said communicating," as claimed, it would have been obvious to modify the teachings of that reference to include this feature at least in view of the following exemplary teachings.

Richardson, for example, discloses, in the area of wireless communications, "[e]xamples of . . . multiple-access systems include . . . orthogonal frequency division multiple access (OFDMA)." Richardson at ¶ [0001] (Background of the Invention). *See also id.* at ¶ [0038] ("system controller 130 couples to APs 110 and provides coordination and control for these base stations. System controller 130 may be a single network entity or a collection of network entities. For a distributed architecture, the APs may communicate with one another as needed. In some aspects, the system may support multiple protocols such as . . . OFDMA"). *See also* Seok at ¶ [0008] ("54 Mbps in maximum can be supported by applying the orthogonal frequency division multiplex (OFDM) technology."); Olkkonen at ¶ [0013] ("[t]he IEEE 802.11 (a) Standard is designed for either the 2.4 GHz ISM band or the 5 GHz U-NII band, and uses orthogonal frequency division multiplexing (OFDM) to deliver up to 54 Mbps data rates").

Furthermore, using orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers would have been obvious to try, as it involves a choice from a finite number of identifiable, predictable solutions, with a reasonable expectation of success.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine one or more of the above references with any reference that allegedly lacks disclosure of the claimed feature. Further, a person of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success.

B.   Invalidity of the '682 Patent Based on 35 U.S.C. § 112, ¶ 1 (Enablement and Written Description)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '682 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '682 Patent are invalid for failure to provide a written description that enables the full scope of the asserted claims and demonstrates that the inventor had possession of the claimed invention based on at least the following claim terms, phrases, or limitations:

- "generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups" (claim 1)

    o   The specification and drawings of the '682 Patent do not define or describe how the CMTS generates a composite SNR-related metric based at least in part on a worst-case SNR profile in such full, clear, and concise terms sufficient to demonstrate that the inventor was in possession of the claimed invention. Further, the lack of sufficient written description for this term fails to enable a person of ordinary skill in the art to practice the claimed subject matter without undue experimentation.

Based on Defendant's present understanding of Plaintiff's Supplemental Infringement Contentions and apparent interpretation of the scope of the asserted claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C.   Invalidity of the '682 Patent Based on 35 U.S.C. § 112, ¶ 2 (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the claims of the '682 Patent, to the extent such positions can be understood from Plaintiff's Supplemental Infringement Contentions, Defendant asserts that the asserted claims of the '682 Patent are invalid for reciting at least the following claim terms, phrases, or limitations:

- "a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics" (claim 1)

  o This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

- "[communicating with /corresponding to] said one of said plurality of service groups" (claim 1)

  o This term is indefinite under 35 U.S.C. § 112, ¶ 2 for at least the reasons set forth in Defendant's Responsive Claim Construction Brief (Dkt. 104).

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate the definiteness requirements of 35 U.S.C. § 112.

IX.   OTHER RELEVANT REFERENCES

Defendant reserves the right to rely on the prior art references identified in connection with one of the Asserted Patents in connection with any other of the Asserted Patents. In addition, Defendant hereby cites the following additional references as being relevant to the subject matter claimed in the Asserted Patents. Defendant reserves the right to rely on one or more of the following references as anticipatory references under 35 U.S.C. § 102, as further evidence of obviousness under 35 U.S.C. § 103, as background references demonstrating the state of the art at the time of the alleged in invention of the Asserted Patents, as a limitation upon the doctrine of equivalents, or for any other purpose. Based on further investigation and discovery, based on positions that Plaintiff may take regarding the scope of the asserted claims, and/or based on the Court's claim construction, Defendant reserves the right to further revise these contentions and to rely on these references to prove the invalidity of the Asserted Patents in a manner consistent with this Court's Rules and with the Federal Rules of Civil Procedure.

a)   **Prior Art Patents and Publications**

Number	Published/Issued Date	Short Name
U.S. Patent App. Pub. No. 2009/0252112 A1	October 8, 2009	Shimomura
U.S. Patent App. Pub. No. 2005/088980 A1	April 28, 2005	Mikko
U.S. Patent App. Pub. No. 2006/0248429 A1	November 2, 2006	Grandhi
U.S. Patent App. Pub. No. 2007/0002884 A1	January 4, 2007	Jaakkola
U.S. Patent App. Pub. No. 2006/0159041 A1	July 20, 2006	Zhun
U.S. Patent No. 9,655,031	May 16, 2017	Sashihara
U.S. Patent App. Pub. No. 2006/0268749 A1	November 30, 2006	Rahman
U.S. Patent App. Pub. No. 2006/0111103 A1	May 25, 2006	Jeong
U.S. Patent App. Pub. No. 2009/0011768 A1	January 8, 2009	Seok '768
U.S. Patent App. Pub. No. 2010/0257265 A1	October 7, 2010	Hamada
U.S. Patent No. 7,013,342	March 14, 2006	Riddle
CN 101,489,222 A	July 22, 2009	Xu
U.S. Patent App. Pub. No. 2008/0014870 A1	January 17, 2008	Kim '870
KR 100,814,402 B1	March 18, 2008	Hur
U.S. Patent No. 8,582,675	November 12, 2013	Harris
U.S. Patent App. Pub. No. 2013/0091528 A1	April 11, 2013	Honda
U.S. Patent No. 7,116,958	October 3, 2006	Brown
CN 101,404,782 A	April 8, 2009	Yeh
U.S. Patent No. 5,535,240	July 9, 1996	Carney
U.S. Patent No. 5,719,867	February 17, 1999	Borazjani
U.S. Patent App. Pub. No. 2009/0174822 A1	July 9, 2009	Pugel '822

U.S. Patent No. 2004/0218700 A1	November 4, 2004	Zhang '700
U.S. Patent No. 6,760,342	July 6, 2004	Skones
U.S. Patent App. Pub. No. 2009/0141833 A1	June 4, 2009	Kim '833
U.S. Patent No. 7,145,972	December 5, 2006	Kumar
U.S. Patent No. 6,980,913	December 27, 2005	Meir
U.S. Patent No. 7,684,467	March 23, 2010	Li '467
U.S. Patent App. Pub. No. 2010/0226330 A1	September 9, 2010	Haque
U.S. Patent App. Pub. No. 2008/0225174 A1	September 18, 2008	Greggain
U.S. Patent App. Pub. No. 2005/0243910 A1	November 3, 2005	Lee
U.S. Patent App. Pub. No. 2009/0235316 A1	September 17, 2009	Wu
U.S. Patent No. 2010/0239052 A1	September 23, 2010	Ballester
JP 2009/177834 A	August 6, 2009	Blair
JP 2007/502090 A	February 1, 2007	Di
JP 2006/504986 A	February 9, 2006	Petrovic
JP 2002/512750 A	April 23, 2002	Marsh
U.S. Patent App. Pub. No. 2005/0183130	August 18, 2005	Sadja '130
U.S. Patent No. 6,356,539	March 12, 2002	Zuliani
U.S. Patent App. Pub. No. 2008/0066113 A1	March 13, 2008	Skelly '113
U.S. Patent No. 7,010,265	March 7, 2006	Coffin
U.S. Patent No. 6,496,546	December 17, 2002	Allpress
U.S. Patent No. 8,514,982	August 20, 2013	Dubash
EP 0774181 B1	May 21, 1997	Carney
U.S. Patent App. Pub. No. 2007/0091212	April 26, 2007	Lee '212
U.S. Patent No. 7,463,874	December 9, 2008	Kang

143

U.S. Patent No. 8,599,312	December 3, 2013	Hendrickson
U.S. Patent No. 8,605,224	December 10, 2013	Trager
U.S. Patent App. Pub. No. 2008/0106652	May 8, 2008	Magnusen
JP 2008/263338 A	October 30, 2008	Nakano
U.S. Patent No. 6,118,499	September 12, 2000	Fang
EP 0883934 B1	August 28, 2002	Dent
U.S. Patent App. Pub. No. 2010/0074167 A1	March 25, 2010	Dale
U.S. Patent App. Pub. No. 2011/0103274 A1	May 5, 2011	Vavik
U.S. Patent App. Pub. No. 2013/0272353 A1	October 17, 2013	Fox
U.S. Patent App. Pub. No. 2013/0294489 A1	November 7, 2013	Thibeault
U.S. Patent App. Pub. No. 2008/0101210 A1	May 1, 2008	Thompson
U.S. Patent No. 7,548,548	June 16, 2009	Rakib
U.S. Patent No. 6,757,253	June 29, 2004	Cooper '253
U.S. Patent App. Pub. No. 2008/0022162 A1	January 24, 2008	Qiu
U.S. Patent App. Pub. No. 2013/0107921 A1	May 2, 2013	Prodan '921
U.S. Patent App. Pub. No. 2010/0100919 A1	April 22, 2010	Hsue
U.S. Patent App. Pub. No. 2008/0140823 A1	June 12, 2008	Thompson '823
U.S. Patent No. 7,991,888	August 2, 2011	Beser
U.S. Patent App. Pub. No. 2002/0062486 A1	May 23, 2002	Park
U.S. Patent No. 8,041,351	June 26, 2008	Quigley
U.S. Patent No. 2004/0015997	January 22, 2004	Ansari
U.S. Patent App. Pub. No. 2011/0072422 A1	March 24, 2011	Brauer
JPH 03251796 A	November 11, 1991	Shigehiro

144

KR 2001/0001312 A	January 5, 2001	Hun-gi
U.S. Patent App. Pub. No. 2003/0161333	August 28, 2008	Schain
U.S. Patent No. 6,332,210	December 18, 2001	Barkataki
U.S. Patent App. Pub. No. 2004/0230997	November 18, 2004	Kaylani
U.S. Patent App. Pub. No. 2003/0163722	August 28, 2003	Anderson
KR 1999/0047147 A	July 5, 1999	Lim
U.S. Patent No. 6,453,472	September 17, 2002	Leano
WO 2001/017175 A1	March 8, 2001	Quigley '175
U.S. Patent No. 7,583,704	September 1, 2009	Walker
U.S. Patent App. Pub. No. 2002/0021465	February 21, 2002	Moore
U.S. Patent App. Pub. No. 2003/0106067	June 5, 2003	Hoskins
U.S. Patent No. 7,423,982	September 9, 2008	Briggs
U.S. Patent No. 2002/0049861	April 25, 2002	Bunn
KR 2001/0075753 A	August 11, 2001	Yoon
U.S. Patent No. 4,450,534	May 22, 1984	Solimeno
U.S. Patent No. 7,227,933	June 5, 2007	Davis
U.S. Patent App. Pub. No. 2004/0181811	September 16, 2004	Rakib
U.S. Patent No. 8,126,044	February 28, 2012	Cavanagh
U.S. Patent No. 8,649,421	February 11, 2014	Renken
U.S. Patent No. 7,978,735	July 12, 2011	Ezra
U.S. Patent App. Pub. No. 2008/0120667	May 22, 2008	Zaltsman
U.S. Patent No. 5,008,903	April 16, 1991	Betts
U.S. Patent No. 7,227,889	June 5, 2007	Roeck

U.S. Patent No. 6,782,884	August 31, 2004	Chen
U.S. Patent App. Pub. No. 2003/0145075	July 31, 2003	Weaver
U.S. Patent App. Pub. No. 2010/0180315	July 15, 2010	Nakamichi
U.S. Patent App. Pub. No. 2005/0122996	June 9, 2005	Azenkot
U.S. Patent No. 7,246,368	July 17, 2007	Millet
U.S. Patent No. 6,031,878	February 29, 2000	Tomasz
U.S. Patent No. 7,489,641	February 10, 2009	Miller
U.S. Patent No. 7,788,684	August 31, 2010	Petrovic '684
U.S. Patent No. 8,352,995	January 8, 2013	Sadja '995
U.S. Patent App. Pub. No. 2004/0093370	May 13, 2004	Blair '370
WIPO Pub. No. WO 97/32403	September 4, 1997	Dent
CN 101404782A	April 8, 2009	Xinmin
U.S. Patent No. 7,522,901	April 21, 2009	Dauphinee
U.S. Patent App. Pub. No. 2006/0114353	June 1, 2006	Narita '353
U.S. Patent App. Pub. No. 2007/0052406	March 8, 2007	Payne
JP 2006066941A	March 9, 2006	Tonai
U.S. Patent App. Pub. No. 2013/0114480	May 9, 2013	Chapman
U.S. Patent No. 7,113,484	Sept. 26, 2006	Chapman '484
U.S. Patent App. Pub. No. 2002/0104083	August 1, 2002	Hendricks
U.S. Patent App. Pub. No. 2007/0124478	May 31, 2007	Abdelhamid
U.S. Patent No. 6,587,479	July 1, 2003	Bianchi
U.S. Patent No. 7,058,007	June 6, 2006	Daruwalla
U.S. Patent No. 7,290,046	October 30, 2007	Kumar

146

U.S. Patent No. 7,317,896	January 8, 2008	Saxena
U.S. Patent App. Pub. No. 2010/0254283	October 7, 2010	Hanks
U.S. Patent App. Pub. No. 2005/0114904	May 26, 2005	Monk
U.S. Patent App. Pub. No. 2003/0115610	June 19, 2003	Cho
U.S. Patent No. 7,528,888	May 5, 2009	Narita
U.S. Patent No. 7,295,518	November 13, 2007	Monk '518
U.S. Patent No. 8,085,802	December 27, 2011	Monk '802
U.S. Patent App. Pub. No. 20080/123755	May 29, 2008	Clausen
U.S. Patent App. Pub. No. 2008/0250133	October 9, 2008	Lee
U.S. Patent App. Pub. No. 2009/0154927	June 18, 2009	Oksman

b)   **Non-patent Prior Art Publications**

Author or Publisher	Title	Publication/Use Date
IEEE Computer Society	IEEE Standard for Information technology— Telecommunications and information exchange between systems— Local and metropolitan area networks— Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	June 12, 2007
Matthew Gast	802.11 Wireless Networks: The Definitive Guide	April 2002

CWNP (Certified Wireless Network Professionals)	Link Adaptation	September 18, 2007
Anand Prasad, Neeli Prasad	802.11 WLANs and IP Networking: Security, QoS, and Mobility	2005
ECMA International	Standard ECMA-368: High Rate Ultra Wideband PHY and MAC Standard	December 2005
Mike Kershaw, Joshua Wright	802.11b Firmware-Level Attacks	September 29, 2006
Cisco Press	Cisco Network Security Fundamentals: Wireless Security	December 30, 2004
S. M. Jahangir Alam, M. Rabiul Alam, Guoqing Hu, and Md. Zakirul Mehrab	Bit Error Rate Optimization in Fiber Optic Communications	December 2011
Fred Harris, Robert McGwier, Benjamin Egg	A coupled multichannel filter bank and sniffer spectrum analyzer	September 16, 2010
A D Sayers	Techniques for Digital Implementation of Multi-mode Radio Receivers	2005
Mohammad Hajirostam	ON-CHIP BROADBAND TUNER DESIGN FOR CABLE MODEM AND DIGITAL CATV	2007
Embedded Staff	Dealing with the mobile TV design challenge	July 28, 2008
Christopher Bowick	Radio Architectures, Pt 5: ADCs and Receivers	March 24, 2008
Peter E. Buxa	Parameterizable Channelized Wideband Digital Receiver for High Update Rate	2007
Roghoyeh Salmeh	LNA and Mixer Designs for RF Front-Ends	June 2007
Walt Kester	Which ADC Architecture Is Right for Your Application?	June 2005
Maxim Integrated	Application Note 290: ADCs For Simultaneous Sampling	October 1, 2000
Stefan Andersson	Multiband LNA Design and RF-Sampling Front-Ends for	2006

148

	Flexible Wireless Receivers	
Bill Schweber	TV tuner IC captures analog, digital standards, features LNA and tracking filters for superior performance	July 29, 2009
Anders Jonasson, Nedim Ramiz	Construction of a digital-TV receiver for the second-generation satellite broadcasting, DVB-S2	July 20, 2007
Douglas Mauro, Kevin Schmidt	Essential SNMP	July 2001
Walter Ciciora, James Farmer, David Large, Michael Adams	Modern Cable Television Technology - Video, Voice, and Data Communications, 2nd Edition	2003
Walter Ciciora, James Farmer, David Large	Modern Cable Television Technology - Video, Voice, and Data Communications, 1st Edition	1998
Cisco Systems, Inc.	Cable Modem Upstream RF Adaptation	June 13, 2011
Multimedia over Coax Alliance	MoCA MAC/PHY Specification v1.0	July 1, 2009
Multimedia over Coax Alliance	MoCA MAC/PHY Specification v1.0	August 29, 2008
CableLabs	DOCSIS 3.1 Physical Layer Specification	October 29, 2013
CableLabs	DOCSIS 3.1 MAC and Upper Layer Protocols Interface Specification	October 29, 2013
CableLabs	DOCSIS 3.0 Physical Layer Specification	August 4, 2006
CableLabs	DOCSIS 3.0 MAC and Upper Layer Protocols Interface Specification	August 4, 2006
CableLabs	Radio Frequency Interface Specification	March 11, 1999

X.   SUBJECT-MATTER ELIGIBILITY OF THE ASSERTED PATENTS

Section 101 "defines the subject matter that may be patented under the Patent Act." *Bilski*

v. Kappos, 561 U.S. 593, 601 (2010). Under § 101, the scope of patentable subject matter

encompasses "any new and useful process, machine, manufacture, or composition of matter, or

149

any new and useful improvement thereof." *Id.* (quoting 35 U.S.C. § 101). These categories are not limitless, as § 101 contains an important exception—abstract ideas are not patentable. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 134 S. Ct. 2347, 2354 (2014). The determination of whether a claim recites patent-eligible subject matter under § 101 is guided by the two-step analytical framework set forth in *Alice, id.* at 2355. The first step requires determining whether the claims are directed to an abstract idea. *Id.* If so, the second step requires determining whether the claim elements, considered individually and as an ordered combination, "amount to significantly more" than the patent-ineligible concept. *Id.*

The first step in the *Alice/Mayo* framework is to examine the focus of the claim and determine whether the claim as a whole is directed to an abstract idea. *See Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015) ("Under step one of *Mayo/Alice*, the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter."). While courts should be careful not to oversimplify the claims at this stage of the analysis, the analysis should not focus on excess verbiage or implementation details, but instead focus on the "concept embodied by the majority of the limitations." *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014); *see also Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1256 (Fed. Cir. 2016) (examining claim after being "stripped of excess verbiage"). Transformation into a patent-eligible claim requires "more than simply stating the abstract idea while adding the words 'apply it.'" *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.,* 132 S. Ct. 1289, 1294 (2012)). Also, a claim is not meaningfully limited if it includes only token or insignificant pre- or post-solution activity—such as merely identifying a technological environment. *Mayo*, 132 S. Ct. at 1297–98, 1300–01. Finally, "simply appending conventional steps, specified at a high level of generality," to abstract ideas cannot make those

ideas patentable. *Mayo*, 132 S. Ct. at 1300; *see also Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323 (Fed. Cir. 2012) ("Such a broad and general limitation does not impose meaningful limits on the claim's scope.").

The Federal Circuit has clarified that a relevant inquiry at *Mayo*/*Alice* step one is to "ask whether the claims are directed to a specific improvement in the capabilities of computing devices, or, instead, 'a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool.'" *Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1361-62 (Fed. Cir. 2018) (quoting *Enfish, LLC v. Microsoft Corp.,* 822 F.3d 1327, 1336 (Fed. Cir. 2016)). In *Core Wireless*, the Federal Circuit noted that in *Enfish*, "unlike claims that merely 'add[ ] conventional computer components to well-known business practices,' the claimed self-referential table was 'a specific type of data structure designed to improve the way a computer stores and retrieves data in memory.'" *Id.* (quoting *Enfish*, 822 F.3d at 1338–39) (underlining added). The Federal Circuit further emphasized that claims directed to the improvement in the functioning of a computer must teach a specific and new method that enables a computer "to do things it could not do before." *Id.* For example, in *Finjan, Inc. v. Blue Coat Systems, Inc.*, the Federal Circuit "held claims directed to a behavior-based virus scanning method directed to patent eligible subject matter because they 'employ[ ] a new kind of file that enables a computer security system to do things it could not do before.'" *Id.* (citing *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299 (Fed. Cir. 2018)).

As further disclosed in Exhibit G,[14] the asserted claims of the '690 Patent are directed to patent-ineligible subject matter under 35 U.S.C. § 101.

---

[14] Exhibit G was served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

As further disclosed in Exhibit H,[15] the asserted claims of the '682 Patent are directed to patent-ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Exhibit I,[16] the asserted claims of the '008 Patent are directed to patent-ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Exhibit J,[17] the asserted claims of the '826 Patent are directed to patent-ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Exhibit K,[18] the asserted claims of the '362 Patent are directed to patent-ineligible subject matter under 35 U.S.C. § 101.

These Eligibility Contentions address only those claims that Plaintiff has asserted in its Supplemental Infringement Contentions against Defendant. Defendant incorporates by reference any and all other subject matter eligibility contentions that have or will be served in this case or any other case brought by Plaintiff and/or involving the Asserted Patents. Defendant incorporates by reference any and all other bases for invalidity identified during prosecution, reexamination, or any other proceeding before the United States Patent and Trademark Office regarding the Asserted Patents, or any other patents in the same family as any Asserted Patent.

Respectfully submitted,

Dated: June 23, 2023

_/s/ *Albert J. Boardman*_____
Deron R. Dacus
State Bar No. 00790553
The Dacus Firm, P.C.
821 ESE Loop 323, Suite 430

---

[15] Exhibit H was served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.
[16] Exhibit I was served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.
[17] Exhibit J was served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.
[18] Exhibit K was served on Plaintiff with Defendant's Invalidity Contentions on September 2, 2022.

Tyler, TX 75701
Phone: (903) 705-1117
Fax: (903) 581-2543
ddacus@dacusfirm.com

Daniel L. Reisner
David Benyacar
Elizabeth Long
Albert J. Boardman
Melissa Brown
ARNOLD & PORTER KAY SCHOLER LLP
250 West 55th Street
New York, New York 10019-9710
Telephone: (212) 836-8000
Email: daniel.reisner@arnoldporter.com
Email: david.benyacar@arnoldporter.com
Email: elizabeth.long@arnoldporter.com
Email: albert.boardman@arnoldporter.com
Email: melissa.brown@arnoldporter.com

Marc Cohn
Amy DeWitt
Paul Margulies
ARNOLD & PORTER KAY SCHOLER LLP
601 Massachusetts Ave, NW
Washington, DC 20001-3743
Telephone: (202) 942-5000
Email: marc.cohn@arnoldporter.com
Email: amy.dewitt@arnoldporter.com
Email: paul.margulies@arnoldporter.com

Attorneys for Defendant Charter
Communications, Inc.

CERTIFICATE OF SERVICE

I hereby certify that, on June 23, 2023, a true and correct copy of the foregoing document

was served on the below counsel of record for Plaintiff:

James Shimota
Jason Engel
George Summerfield
Katherine Allor
K&L GATES LLP
70 W. Madison Street, Suite 3300
Chicago, IL 60602
Tel.: (312) 372-1121
jim.shimota@klgates.com
jason.engel@klgates.com
george.summerfield@klgates.com
Katy.Allor@klgates.com

Nicholas F. Lenning
K&L GATES LLP
925 Fourth Ave., Suite 2900
Seattle, WA 98104
Tel.: (206) 623-7580
nicholas.lenning@klgates.com

Darlene Ghavimi
Matthew Blair
K&L GATES LLP
2801 Via Fortuna
Ste. 650
Austin, TX 78746
Darlene.Ghavimi@klgates.com
Matthew.Blair@klgates.com

Wesley Hill (Texas Bar No. 24032294)
Andrea Fair (Texas Bar No. 24078488)
WARD, SMITH & HILL, PLLC
1507 Bill Owens Pkwy
Longview, TX 75604
Tel: (903) 757-6400
wh@wsfirm.com
andrea@wsfirm.com

/s/ Albert J. Boardman
Albert J. Boardman

154